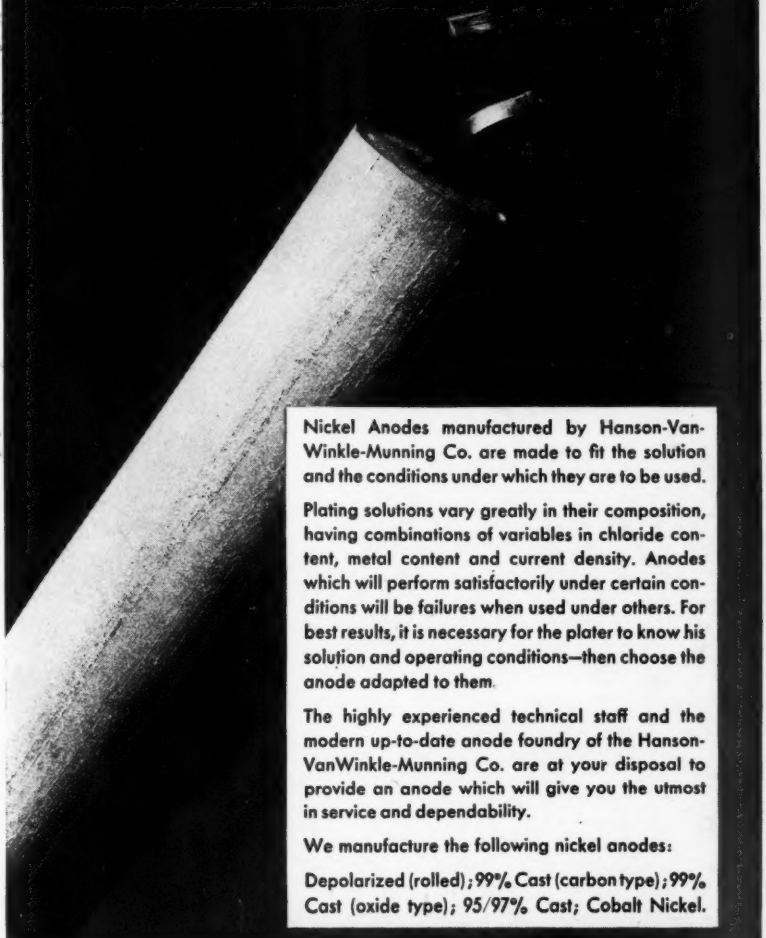
E M Baker

The Monthly Review

Published by the AMERICAN ELECTROPLATERS' SOCIETY

OCTOBER 1938

Fit the Anode to the Job . . .
Not the Job to the Anode



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The Monthly Review

Published by the AMERICAN ELECTROPLATERS' SOCIETY, Inc.

A Society for the Advancement of the Science of Electroplating

OCTOBER 1938

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The MONTHLY REVIEW

Published by the
AMERICAN ELECTROPLATERS' SOCIETY, INC.

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VOL. XXV OCTOBER 1938 NO. 10

Editorial

Since the September issue of the REVIEW was published, we have received four letters from prominent members of the Society. These letters are unsolicited, and two are being published for the benefit of our members, with one thought in mind, that if our readers wish the REVIEW to continue along human interest lines, then the members must co-operate more fully than in the past. We quote from one of the letters received—"You are to be congratulated upon the present issue of the MONTHLY REVIEW It is the 'most newsy' REVIEW that has been published for some time. If this style of publication is maintained the REVIEW will excel many trade journals in the Electroplating field. While the members of the A.E.S. are interested in articles that deal with their work, they want news of what is happening in the electroplating world and in the A.E.S. Keep up this good work."

After making a few very kind personal remarks which we deeply appreciate, knowing the sincerity of the writer, we take pleasure in presenting another letter which reads as follows: "For years members have been talking about making the REVIEW better. All kinds of suggestions have been made and while a lot of them have not been impossible, still they were impracticable at the time suggested. Now that the Convention proceedings are being printed in one special copy, the change in the REVIEW is immediately noticeable, and what a compatible feeling comes over us as we read this month's REVIEW as to what the members are doing elsewhere in our Society". Our branches now can help improve this by having volunteer writers send in the happenings in their part of the country and this will go a great way toward making us into one great large family in our vocation.

Because of a visit to some of our mid-Western and New England Branches, coupled with some news items from Mr. Stanley Hedden, Secretary of Pittsburg Branch and Mr. George Wagner of Newark Branch, we have been able to continue our "Here

and There" column and present the activities of the different Branches in this issue. Obviously it is impossible for the Executive Secretary or any other individual to make this idea a continuous success unless we have the co-operation of our members.

In this connection may we suggest that the Branch Secretaries at their respective meetings ask the members for news items for publication in the REVIEW.

In other words make the Branch reports more newsy, and inject a real spirit of human interest into them. Don't be afraid to send in your copy, we will see that it is taken care of before being published.

Again may we call to the attention of each one personally, the matter of advertising in the REVIEW. By this means we have been able to present the copies of the proceedings to our members this year. The membership as a whole however, has not appreciated this and has failed to co-operate.

It is our desire to emphasize, as never before, the value of paid ads in the REVIEW. If we are to do more for the branches, we must have more money at our disposal. Now that business is improving, why not help us by asking your supply house man to see that his Company is an advertiser in your own publication, the MONTHLY REVIEW.

The members of the A.E.S. are receiving more from the Society for the amount of money paid for dues than is given by any similar organization. Is it too much to ask our members to be a little more co-operative in the things we have suggested, so that we may be more helpful to our individual members and at the same time aid in putting our weaker branches on their feet again?

Our receipts for advertising total a little over $500 per month at present. We should have at least $700 per month. Our advertising prices are as follows:

Full page ad $25.00 per month; ½ page ad $15.00; ¼ page ad $8.50.

While we are asking for support in the objects mentioned we are asking also that our advertisers be kept in mind when supplies and equipment are being purchased. Advertising is a business proposition and must be looked upon as such. Therefore, if the REVIEW is to continue advertising we must prove that the money spent by our advertisers is getting results.

For the information of those who may have the impression that we have a selfish personal interest, suffice it to say that the Executive Secretary requested that no commission be granted him on advertising receipts this year. We still place the best interests of the American Electroplaters Society above any personal gain or ambition.

Solvent Degreasing *in the* Plating Industry

By H. R. NORGREN

Assistant Sales Manager
Detroit Rex Products Company
Detroit, Michigan

Read at Detroit Branch Meeting Sept. 9

RECENT improvements in cleaning practice and degreasing equipment, which are being used extensively for the cleaning of metal products prior to plating and finishing, are discussed in some detail in this paper.

This process makes use of stabilized non-inflammable solvents for the efficient removal of oils, grease, and insoluble matter from the work.

Rather than limiting this discussion to vapor cleaning, as the published title of this talk would indicate, and which is only one phase of degreasing, I believe it will be more interesting to you if we cover degreasing in general and then deal specifically with the phases and equipment designs used in the cleaning of metal products prior to electro-plating.

Solvent degreasing is a comparatively new science in which rapid developments have been made through engineering research and industrial applications. It has been adopted by leading manufacturers of all kinds of metal products—both ferrous and non-ferrous—for the removal of oil and grease prior to finishing (including plating, lacquering, painting, and rust proofing), inspection, and heat treating. The products degreased range from hypodermic needles to large automobile body parts and refrigerator boxes.

Fundamentally, the process simply depends upon the dissolving action of a stabilized, non-inflammable, chlorinated hydrocarbon, either in the liquid or the vapor state for the removal of oil and grease. Efficient use of the solvent depends upon the application of properly designed degreasing equipment.

The three basic types of degreasers now in general use are known as: (1) vapor, (2) immersion, and (3) spray. Depending upon the work to be cleaned, any combination of these types may be incorporated in one unit.

VAPOR CLEANING

The simple vapor degreaser consists essentially of a chamber in which the liquid solvent is boiled, a space above this boiling chamber to hold the hot solvent vapors (in which the work is cleaned), and condenser to maintain the vapor level. This condenser is balanced against the heat input, and, as the vapor is $4\frac{1}{2}$ times as heavy as air, the solvent is readily retained in the machine. The distillate from the condenser is returned to the storage tank attached to the boiling sump, thus making a complete cycle.

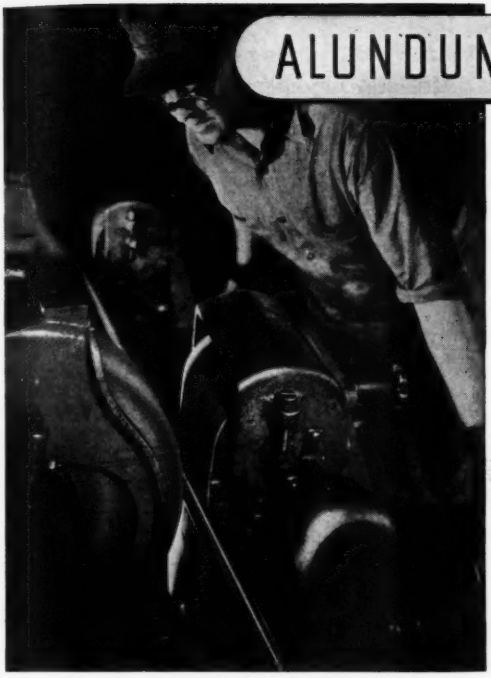
In this method of degreasing, the work is lowered into the solvent vapors only, and being colder than the vapor, the chemically pure solvent vapor is condensed on it. The power of the vapor action depends primarily upon the difference in temperature between the metal and the solvent vapor (which is about 188° F.), and the washing effect is diminished as the temperature of the metal product approaches that of the vapor.

The vapor degreasing method is only recommended in plating departments when there is little or no insoluble matter on the work, and where the gauge of the metal is such that the heat capacity will allow sufficient condensation of vapors on the work to give thorough cleaning.

IMMERSION METHOD

The immersion and spray methods are generally recommended for the plating industry because of the mechanical action from the boiling solvent in the case of an immersion machine or the power spray in the event that a vapor-spray machine is used. This mechanical action effectively removes both soluble and insoluble matter from the work. In these preferred methods of cleaning for plating, more effective results are provided on cupped or intricate shaped and beaded work that would have a tendency to trap oil and not be reached by the solvent vapors alone, due to inner pockets.

ALUNDUM ABRASIVE



. . . popular *for* CENTERLESS POLISHING

ON hand polishing jobs the operator can "favor" the abrasive—varying the pressure and length of time according to the "feel" and speed of the cut. But on machine fed jobs such as centerless polishing the abrasive is strictly on its own.

And that's why Alundum Abrasive is so popular for centerless polishing. Its uniformity—not only in grain size but also in grain shape and capillarity—gives the uniformity in wheel heads that is so essential—uniformity in finish, in cutting action and in wheel life.

Adjustment time when wheels are changed is reduced to the very minimum.

NORTON COMPANY, WORCESTER, MASS.

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NORTON ABRASIVES

The cutaway print of the three-dip immersion-type machine shows that this type of degreaser is generally designed with three chambers: the first holding boiling solvent in which the work is first immersed, the second a liquid rinse of solvent which also has a tendency to re-cool the metal, and the third containing pure solvent vapors which then condense on the work for a final pure rinse. As the work is again heated in the pure vapors, it is then removed from the machine warm, dry, and free from oil, grease, dirt, and solvent. This complete cycle of cleaning operations only requires a total cleaning time of about three-fourths of a minute to three minutes, depending upon the work to be cleaned and the size of the loads.

The three compartment machine shown provides a straight line sequence of cleaning operations for the boil-rinse-vapor cycle. The motor-operated solvent transfer pump is used to return the distillate and overflow from the rinse compartment back to the boiling chamber. It is also used for the transfer of solvent from any one chamber to another within the machine when cleaning the degreaser and distilling the solvent, or filling the machine.

VAPOR-SPRAY-VAPOR CLEANING

As pointed out above, the immersion method provides mechanical action for the removal of insoluble matter which could not be removed by the vapor method only. Where the work and the contamination on the work is of such a nature that it cannot be readily handled in the immersion type machine, or greater mechanical action is necessary for the removal of the insoluble particles that may be on it, a more positive mechanical action is provided in a vapor-spray-vapor type degreaser. In this design of machine the work passes through a short vapor zone, then into a spray zone where the work is forcibly hit by multiple sprays of cooler clean distillate at pressures of from 25 to 30 lbs. per sq. in., and volumes from 80 to 120 gallons per minute. This also acts to cool the work somewhat for the succeeding step, which is the passage through pure hot solvent vapors. In this final cleaning operation, the work is again brought back up to temperature and, in doing this, any traces of oil that might have been left on the work are removed. This design of equipment is best adaptable for automatic production cleaning.

VAPOR SLUSH

A comparatively recent addition to the line of machines is the one known as the vapor-slush. This consists principally of a simple vapor degreaser tank, which is equipped with a special storage tank with a divided or slush compartment and a motor-operated slush pump and nozzle. This design provides both a slush cleaning with solvent distillate and a vapor cleaning. This slush gives the mechanical action required in many cases where insolubles, such as shop dust and buffing compounds, are present.

The vapor-slush type is usually recommended when the size of work or the size of the work load is such that an immersion machine would not be applicable and a strictly vapor machine would not do the job. An important feature of this design is its compactness.

You will note that with all the machine designs described a pure solvent vapor treatment is the last operation to insure that there is absolutely no oil carried over on the work.

The recommendations of our engineers for one or the other of these types of machines depends entirely upon the nature of the work and the cleaning requirements in each individual case.

CONVEYORIZED EQUIPMENT

Any of the aforementioned machines can be made semi- or completely automatic by the use of conveyors. These may be of the monorail, crossrod, wire belt, roller, elevator type lift, or other methods of transfer. The design of handling mechanism is determined by plant production requirements, size, shape, and weight of the work, space limitations, and numerous other factors. Racks, baskets, special fixtures, rotating mechanisms, hooks, etc., may be used to carry the work through the machine. Typical designs of automatic equipment will be illustrated in our movies, which will be shown later.

SOLVENT STILLS

All of these machines are self-distilling. That is, the machine itself may be used to reclaim the solvent by distillation. The oil and other contamination remains in the boiling chamber or

sump, and the pure solvent distillate is collected either in another chamber or a storage tank, depending upon the type of machine. However, with some types of work and where it is not convenient to shut down production for the time necessary to make this distillation, an auxiliary continuous operating still is sometimes recommended. Solvent stills are arranged so that they can also be used for batch operation.

They are equipped with a separator for removing any water with which the solvent might become contaminated during use, a motor driven solvent transfer pump, constant level device, a gauge glass, and thermometer. They are built with a steam injector so that practically complete solvent recovery is possible.

CHLORINATED HYDROCARBONS AS SOLVENTS

Various kinds of chlorinated hydrocarbons have been used for the degreasing of metals for a number of years, but their success commercially was limited due to impurities, unstable condition, and improperly designed equipment.

A few years ago, a method was discovered for stabilizing chlorinated hydrocarbons. In addition, manufacturing improvements have eliminated practically all of the impurities from some of the chlorinated hydrocarbons, thus making them safe and suitable for industrial use.

Trichlorethylene is now accepted by leading industrial authorities as the best and most suitable of these solvents for metal degreasing. It has a boiling point of 186.7° F. (86° C.) and requires only 0.25 B.t.u. to raise one pound one degree F. (0.25 cal./kg./1° C.) and 104.6 B.t.u. to vaporize one pound (58 cal./kg.).

Trichlorethylene is the most satisfactory to stabilize for continuous use. Today, it is stabilized to different degrees and marketed under certain trade names to meet the different requirements of industry.

In the stabilization of chlorinated solvents it is well to bear in mind that the stabilizers must be present in the vapor as well

as in the liquid. They must carry over with, and be condensed under the same conditions as the solvent vapors. Otherwise, where two or more tanks are employed in the machine construction of the degreasing equipment, the solvent might be evaporated and the stabilizer left in the boiling chamber. The materials used for stabilization and the methods employed have not been disclosed due to the patent situation.

In the stabilization of the chlorinated solvents, various conditions had to be overcome to prevent the solvent break-down, setting free corrosive hydrochloric acid when subjected to light, heat, moisture, air and the combination of different kinds of metals. All of these difficulties have been definitely overcome in proportion to the stabilization, except break down due to actinic rays, and excessive heat. However, it can be readily seen that, for commercial use, failure due to either of these last two causes is not serious, for rarely, if ever, does the solvent come in contact with light of sufficient intensity to cause decomposition, and safe temperatures are easily maintained.

The different degrees of stabilization of trichlorethylene referred to above, now enable industry to select the proper degreasing solvent for any cleaning problem. One grade of solvent will work very satisfactorily in a single tank machine, on nearly all types of cleaning. Under certain conditions it can also be used in machines of two or more compartments. There is another grade of solvent, on the other hand, that is stabilized to a much higher degree and is suitable for use in any type of degreaser without fear of decomposition even when used with any or all combinations of metals.

PRINCIPLES OF DESIGN

Some of the various types of degreasers and the solvents have been briefly described, so that the most interesting design problems can now be considered. Degreasers are built according to definite principles as determined by the laws of chemistry, physics and mechanics. From an operating standpoint, the height of a degreaser is sometimes found objectionable. This, however, is definitely determined by the size of the work, and the necessity for constructing the machine so as to insure most economical operation.

The side boards, or the portion above the condenser, are required to prevent the effects of cross air currents which tend to carry out solvent vapors. There is a definite relation between the side board height and the exposed surface area.

Standard degreasers are now equipped with water separators and vapor traps to remove water that may be introduced on the work or condensed from the atmosphere.

With the water jacket condenser, the flow of water is from the bottom to the top. Therefore, the portion of the jacket above the interface vapor-air layer is at a temperature higher than the moisture condensation point, thus preventing the precipitation of moisture from the atmosphere, as would be the case with ordinary coil construction. The temperature of the cooling water is effectively controlled by means of a valve on the inlet side.

Experiments show that the water jacket is 25 to 30 percent more efficient than coils from the standpoint of solvent losses. The water jacket, moreover, prevents the upper side walls of the machine from becoming heated by conduction, thus giving an effective condenser even to the top of the machine. While steam is generally preferred as a heating medium, gas and electricity are used successfully in a number of installations.

Where gas heat is used, a proper stack must be provided to carry off the products of combustion. The stack should reach above the top of the building to insure proper draft, and be equipped with a back-draft eliminator to prevent the products of combustion from being returned to the building.

Oil-immersion, electric heaters work out satisfactorily, providing the user keeps the heating elements clean at all times. Otherwise, incrustation will act as an insulator, reducing the heating efficiency, or even resulting in the burn-out of the elements.

Both electrically-heated and gas-heated degreasers are equipped with bottom safety thermostat.

When steam heat is not available for a large degreasing installation, gas, oil, or electric heated steam generators are generally used to furnish steam.

OPERATING COSTS

It is difficult to give positive cost figures due to the multiplicity of operations and widely varying conditions in different industries. For instance, one manufacturer reports total costs of 17 cents per ton of work, including solvent, labor, overhead and other expenses. This is for a high production on sheet metal products with practically no carry out or drag out. Another manufacturer, who is cleaning intricate parts on a very low tonnage basis, has a total cost of $1.10 per ton. Even at this cost, he reports a very great saving over previous methods.

On an average, the total cost may be figured on a basis of 60 to 70 cents per ton of work, which is considerably less than for other cleaning methods when all factors are considered.

Complaints of excessive costs are usually due to abnormal solvent losses caused by improper operation of the equipment. This is readily remedied by simple instructions to operators, and the inspection of equipment and operating procedure at regular intervals.

ADVANTAGES OF DEGREASING

You may be thinking that degreasing is an added operation in your line, and are wondering as to its advantages. In many cases it eliminates hand scrubbing and saves time in preparation of the metal prior to its introduction into the plating line-up. Cleaner metals are introduced into pickling and electric cleaning solutions. All tanks are kept free from grease, and by putting all work through a degreaser there can be no grease or oil film floating on the tops of any of the tanks in the plating line-up, as is usually seen in plants where degreasers are not employed. To a large extent, rejects due to improper cleaning are eliminated.

MORE COMMENTS FROM OUR MEMBERS REGARDING THE PROCEEDINGS

Paul Oldam: Excellent. A work worth having.

George Gehling: I want to express my appreciation of the good work done in having the convention proceedings printed in one copy and given to the members.

Walter Weiker: Nice work. Surprised they could be gotten out in such a short time.

Wilhelm Castell: I think it's a fine job.

Franklyn J. MacStoker: We wish to acknowledge receipt of the Milwaukee Convention Proceedings. The Branch membership commented favorably on the book as a whole. We regret the fact that the business sessions were omitted, the additional cost of which we would have been willing to pay for. We recognize however, a good job by those who had charge of its production.

Charles Conley: The members of Dayton Branch are well pleased with their copies.

Charles Chace, President, Providence-Attleboro Branch: I think it's fine. The Providence boys like their copies.

Louis Lougee, President, Waterbury Branch: I think it's a fine volume to have.

Mr. C. Kocour, Chicago: Some time ago we wrote you relative to the smallness of the graphs of Mr. Wagner's article as published in the proceedings. Mr. Wagner has been good enough to send us the original graphs from which we had negatives made. We can provide blue line prints from these negatives to anyone interested at cost. This would be $1.50 for the set of 15 graphs 8½ x 11 size.

"SOLVING METAL COATING PROBLEMS WITH THE AID OF THE MICROSCOPE"

Dr. Walter R. Meyer will deliver an address, illustrated by lantern slides, on the above subject at a meeting to be held in Room 309, Havemeyer Hall, Columbia University (117th Street and Broadway), New York, on Friday, November 18, at 7.45 P. M. Dr. Meyer is well qualified to talk on this subject. An interesting as well as instructive evening is in store for all those who attend. Everybody is welcome.

Filtration *of* Electroplating Solutions *with* Celite Filter Aids

By RICHARD J. AMBERG
Johns-Manville Sales Corp.

Meeting
American Society of Electroplaters'
Detroit Branch
October 8, 1938

FILTRATION, by way of introduction, is usually thought of as the removal of solid particles from a liquid medium. It usually entails a closed pressure system in which the liquid is forced through a cloth or metal screen. Before considering the application of filter aids, let us consider just why we filter a plating solution in the first place.

That the presence of dirt, grit, metallic particles, impurities from anodes or any extraneous solid matter impairs the quality of the plated object is probably only too well known by you men present. Their presence means surface roughness and that usually means an increase in buffing effort with probable subsequent pitting and pin-holes. If the plated object is not buffed, its surface smoothness will depend upon a clear, clean solution.

Assuming that a dirty solution is detrimental to the quality of the work, we are next faced with the economic question of whether the installation of a filter will improve the quality to such an extent that it is a worthwhile investment. One of the largest manufacturers of filters for use in the plating industry has calculated that the cost of filtering a solution at the rate of 40 gal. per hour costs 30 cents per day and the cost for an 8000 gal./hour filtration was figured at $3.00 per day, these cost figures, including maintenance, power, labor, repairs, filter aid, all operating charges, insurance, amortization, interest, taxes, and all other owning costs. While probably optimistic to a certain extent, these figures do give some idea of how cheaply a filtration process *may* be operated. Compared to the time and trouble and labor involved in cleaning a heavy deposit of mud and slime from the bottom of the plating tank with the probable loss of solution, filtration certainly appears to be an indispensible part of the plating process.

Assuming that we had decided filtration necessary, another

question may be raised. Why use a filter aid? Some may consider the filter an expensive piece of equipment which should stand or fall on its own merits. The answer to this is obvious. Unless some benefit or benefits, which at least balance the expense and trouble involved in its use are derived from filter aid don't use such a material. However, it so happens that most filters for plating solutions are designed by the manufacturer to be used in conjunction with filter-aid. On the other hand, the type of solids being filtered from a particular solution may be such that no filter aid is necessary. In such a case we would certainly not recommend its use. At any rate, the results that can be and have been obtained are such that any plater who hasn't tried filter aid cannot afford to pass up this possible opportunity to improve his process.

Filter aids are used for four definite reasons. First, their use permits a higher flow rate through the filter. Second, longer cycles between cleaning are obtained. Third, a high and variable degree of clarity in the filtrate can be secured, variable in that there are several different grades of various particle size which give varying degrees of brightness to the filtrate. Fourth, through its use as a precoat longer cloth life can be had. This property alone oftentimes more than pays for the powder necessary for precoating.

To explain why higher flow rates are obtained let us consider how this material functions. If added continuously, as it should be, to solution going into the filter there is built up a porous, yet firm, cake in which each particle of slime and dirt is more or less isolated by a particle of diatomaceous earth. The very nature of the material makes this possible. The particles are so varied in size and shape and present such a tremendous surface area that a regular lattice-work is built up and through these microscopic channels the solution, under pressure, must find its way until it eventually reaches the filter-cloth in a clarified state. In most cases, if the filter aid were not present the dirt would slime over the surface of the filtering medium and form an impervious mass, which would not permit the easy passage of the solution. This is exactly what has happened if, when you find it necessary to clean your filter because the pressure has reached its maximum, there is not a firm cake completely filling the cake space.

And, because the cake built up is porous, the filter will run for a greater length of time before cleaning is necessary.

We spoke of a high and variable degree of clarity. Through different methods of processing and controlling of particle size, we are able to produce several different grades of filter aids which act differently in the body of the filter. A grade such as Filter Cel will give the highest degree of clarity of any of our standard grades, the reason for this being that Filter Cel is composed of a higher percentage of fine particles than any of our other grades and forms a much tighter cake in the filter. Clarity and flow rate, however, are usually, but not always, inversely proportional to one another. That is, a high degree of clarity is usually obtained at a sacrifice in flow rate and vice versa. This relationship is true up to the point where the cake becomes so porous that the particles to be filtered out pass right thru the filter aid and slime over the retaining surface. This is an extreme case and one which you probably will never come across in deciding whether to use Filter Cel or Hyflo Super Cel in filtering plating solutions. This latter grade is the one most commonly used in this connection. The most efficient and economical grade to use is the one which will give the highest flow rate with the desired degree of clarity.

We spoke of the use of a precoat as a means for protecting the filter cloth or screen. The precoat is a thin layer of filter aid applied directly to the cloth in previously filtered solution, or, if dilution is inconsequential, in water. The proper amount of powder is simply stirred into the precoating liquid and pumped into the body of the filter.

The quantity of liquid necessary for precoating is simply enough to completely fill the body of the filter, the pump, and intermediate lines leaving sufficient liquid in the precoating tank to prevent the pump from sucking air. The filtrate is returned to the precoating tank until all the powder is in the filter. Mild agitation is necessary to prevent the filter aid from settling. Usually the return line from the filter may be placed in the tank in such a way as to set up a swirling motion, thus eliminating the necessity of manual agitation. If mechanical agitation is used, a paddle revolving at the rate of 15 revolutions per minute is sufficient to keep the powder in suspension.

Concerning the proper amount of powder to use for precoating we have found that quantities equivalent to 10 pounds per hundred square feet of filtering area will give a precoat one-sixteenth inch thick, and this thickness is usually enough. The precoat should be applied as fast as possible to ensure complete coverage of the filter cloth from top to bottom. Precoating is usually accomplished with but very little pressure on the filter, as indicated by the gauge.

The amount of filter aid to be used in the main body of solution normally amounts to from 0.1% to 0.5% based on the weight of solution. Thus, the amount in a batch of 100 gallons would be roughly between one and four pounds. The proper amount to use varies with the type of solution and may vary from plant to plant on the same solution. One thing to bear in mind, however, is that the presence of an amount of filter aid greatly in excess of the proper amount does not materially increase the flow rate and only serves to fill the cake space more rapidly than otherwise, thereby reducing the length of cycle. This can be seen by looking at the relationship between flow rate and percent of filter aid present. From the curve it can be seen that there is a definite range where the slope of the curve approaches an angle of 45°, which means that in this particular range the rate of flow is at its optimum point with respect to the percentage of filter aid. In the curve shown, the range is between 0.4% and 0.6%. It can be seen clearly that increasing the amount of filter aid beyond 0.6% does not increase the flow rate to any great extent. Also, using less than 0.4% does not give an efficient rate of flow.

Whether the filtration process is continuous or batchwise the solution going into the filter should be homogeneous as far as the filter aid is concerned. That is, a gallon of solution going into the filter at the start of the run should contain as much filter aid as a gallon entering near the end of the run. Operation in this manner insures a uniformly porous filter cake and best efficiency from the filter. It does, however, require some additional equipment, usually inexpensive. There are several different installations which may be used to advantage. The solution may be pumped from the bath directly to the filter. A small tank, of say 50 or 100 gallons capacity and containing a concentrated slurry of filter aid is cut into the line on the intake side of the pump. Thus the pump will be supplying the filter with dirty

solution from the bath and also a small quantity of filter aid. Rate of flow from the slurry tank is governed by the setting of the outlet valve. The one difficulty with this set-up is the fact that the slurry tank must be located high enough so that it will feed into the suction side of the pump without the necessity of an extra injection pump.

Probably a simpler arrangement would be to install the slurry tank at the same level as the bath and as close to it as possible. By means of a siphon or straight line pipe below the minimum liquid level, the level of liquid in both tanks could be maintained at the same height. Filter aid could be added to the smaller tank but would necessarily have to be added continuously. This could be accomplished by means of a dry powder feeder or by manual means, the latter usually being inconvenient and expensive from a labor standpoint.

A more fool proof and likewise more expensive method would consist of the same set-up of tanks but include two pumps, one handling the main volume of solution from bath to filter and the other injecting slurry from the small tank into the suction side of the main pump.

In continuous filtration systems it is essential of course to provide a by-pass around the filter to be used during shut-down for cleaning.

If filtration is carried out batchwise, another possibility would be to pump the dirty solution into a separate storage tank, clean out the plating tank, add the powder directly to the agitated storage tank and pump into the previously precoated filter and back to the bath.

In regard to the type of filter, both the plate and frame and the closed pressure type are used successfully. Plate and frame filters are commonly used in large installations. One of their chief assets is the fact that the amount of filtering area may be increased or decreased simply by the addition or removal of one or more plates. If possible, filters of this type should have the inlet at the bottom and outlet at the top, thus insuring a completely filled press before any filtration takes place, which in turn insures a uniform precoat. The grid surfaces of the plates should be checked frequently for wear and corrosion. If the grids are not well defined, the filter cloth may be forced into the

drainage channels at higher pressures, thus restricting the flow. Often a metal screen of suitable material and of about fly-screen mesh placed between the cloth and plate will remedy such a condition. The filters made by Sperry and Shriver are well-known in this field.

Closed pressure filters such as those manufactured by Industrial Pump and Filter Co., Belke, and Oliver are well known and often used for filtering plating solutions. These filters are self-contained units, convenient to operate, and are usually portable so that they can be moved about in the plating room. The filtering elements may be either metal screens of mesh fine enough to hold a precoat, or they may consist of wooden baffles covered by cloth. The type of solution filtered will determine their construction. One manufacturer recommends the following:

Solution Filtered	*Pumps*	*Fittings*	*Baffles*	*Bags*
Cyanide	Iron	Iron	Steel mesh	Twill weave cotton
Room temp. Ni Sol.	Bronze		Cypress	Twill weave cotton
Room temp. Ni or Acid Copper Sol.	Bronze		Cypress	Pure wool
Chrome	Steel	Steel & Iron	Steel mesh	Woven Asbestos
Hot Nickel or Acid Copper Sol.	Monel Metal		Cypress	Pure wool

A word about pumps might not be amiss. Centrifugal pumps are probably the most commonly used. They give a uniform flow free from pulsations which is very desirable as far as the filter is concerned. Also a valve may be closed against the head of such a pump without danger. Steam pumps generally are not desirable in that they tend to deliver the liquid into the filter in pulsations which have a tendency to pack the filter cake abnormally. However, the installation of a suitable surg chamber has been found to greatly improve these pumps. A section of pipe about one foot in diameter by two feet in height tapped for two pipes at the bottom diametrically opposite provides a pretty fair absorption chamber.

Diaphragm pumps are also used, such pumps providing positive displacement and requiring no priming.

The question may be raised as to whether diatomaceous earth, being silica although amorphous, will erode pumps. It is true that any solid matter passing through a pump will tend to wear the parts upon which it comes in contact. However, the additional abrasion due to filter aid is usually negligible compared to the dirt and grit in the solution in the first place.

After having seen the motion picture, you probably all have a good idea of just what diatomaceous is and what most of its properties are. That it is an inert, insoluble material was, I believe, well demonstrated. It is, of course, insoluble in plating solutions. Its action in the filter is purely mechanical. By this is meant that it has no adsorptive properties such as have activated carbons. It will assist in the removal of solid particles even though they be colloidal in size but it has no effect on coloring matter which is in true solution, and it will not help in the removal of oil or grease which often finds its way into the plating solution. Where carbon is used the amount of filter aid usually must be increased by the weight of carbon used plus the amount which would be used if the carbon were not present. There are, of course, several methods by which carbon may be used, probably the best being to add the carbon to a separate tank before filtration takes place. Some work has been done in which the carbon is applied over the precoat in the body of the filter. Thus far, however, this method does not seem to have met much success, probably because the period of contact between the solution and the carbon is not long enough to effect a thorough adsorption.

To summarize briefly our remarks, we find that diatomaceous earth is used to assist filtration by increasing the flow rate and improving the clarity of the filtrate. Through its use as a precoat, the filter aid transfers the filtering surface from the filter cloth or screen to its own surface, thus protecting and increasing the life of that cloth or screen. Likewise, small additions to the batch keep the cake formed open and porous permitting longer cycles between cleaning. The filter aid is an industrial material used for a definite purpose and, if used intelligently, will provide a return on investment far in excess of its original cost.

Here and There

BETHLEHEM, CONN. The annual fall event known as the Lea Manufacturing Company's outing was held at Leacrest, the home of Robert Leather, President of the Company, on Saturday, October 1st. The usual Leather weather luck was with us as the day was beautiful for such a gathering. There was a good attendance, many members of the A.E.S. and visitors coming from long distances. Games were played and prizes awarded. Sandwiches and refreshments were enjoyed between the sporting events. Roland Ducette of the Frederick Gumm Chemical Co. acted as refreshment dispenser, while Bob Mooney of the Zapon Co. saw that those present received a nice new one dollar tag.

Joe Sullivan, Secretary of New Haven Branch, and his partner, Jack Barry of the H. C. Cook Co., Ansonia, along with Al Huber, Manning Bowman Co., Meriden, won the prize for horseshoe pitching.

The trap shooting contest was won by C. W. MacIntyre, French Mfg. Co. The Archery contest was won by Frank Kiessling, American Fastener Co. Those three gentlemen from the Hub gave a great exhibition of horseshoe pitching. One of them was the champion of Massachusetts (champion of the world would be better). Telling about his exploits wouldn't do it justice. You've got to see him perform to really appreciate his act. The spectators gave him rounds of applause which were well deserved. The following is a partial list of those who attended.

C. A. Kohrs, 106 Hoffman St., Torrington, Conn., Union Hdwe. Co.
John Theisien, Manning-Bowman & Co., Meriden, Conn.
Bill Ehrenchrona, Casco Products Co., Bridgeport, Conn.
Tony Maz, Risdon Mfg. Co., Waterbury Conn.
Jack Gormley, A. C. Gilbert Co., New Haven, Conn.
Howard Lane, Chase Companies, Waterbury, Conn.
Carl S. Johnson, Apothecaries Hall Co., Waterbury, Conn.
Geo. M. Millspaugh, Seth Thomas Clock Co., Thomaston, Conn.
Clifford R. Prescott, Eyelet Specialty Co., Waterbury, Conn.
Norman Eddy, Greist Mfg. Co., New Haven, Conn.
D. J. Muscio, Lux Clock Co., Waterbury, Conn.
Hank Kellner, Lea Mfg. Co.
W. P. North, Patent Button Co., Waterbury, Conn.
A. Rosenthal, Underwood Elliott Fisher Co.
Nelson Locke, Underwood Elliott Fisher Co.
Geo. Muscio, Lea Mfg. Co.
J. Cooper, Underwood Elliott Fisher Co.
J. M. Barry, H. C. Cook Co., Ansonia, Conn.
Joe Sullivan, New Haven Clock Co., New Haven, Conn.
W. J. R. Kennedy, Springfield, Mass.
A. Huber, Manning Bowman & Co., Meriden, Conn.
Geo. C. Heinrich Co., Manning, Bowman & Co., Meriden, Conn.
G. Varney, Underwood Elliott Fisher Co.
W. Fisher, Underwood Elliott Fisher Co.
Wm. Bridget, H. L. Judd Co., Wallingford, Conn.
F. Thomas, Roxalin.
H. S. Rice, Apothecaries Hall Co., Waterbury, Conn.
K. C. Hawthorne, Seth Thomas Clocks, Thomaston, Conn.
Frank Kiessling, American Fastener Co., Waterbury, Conn.
Henry Mahlstedt, United Chromium, Inc., Waterbury, Conn.
Joe Downes, Remington Rand, Middleton, Conn.
Ted Hill, Waterbury Buckle Co., Waterbury, Conn.

T. H. Chamberlain, New Haven Clock Co., New Haven, Conn.
R. Hughes, Lea Mfg. Co.
E. Couch, Lea Mfg. Co.
Collins L. Hall, General Abrasive Co., Niagara Falls, N. Y.
A. O. Dehle, Colgate-Palmolive-Peet Co., Jersey City, N. J.
Chas. Nardozzi, American Fastener Co., Waterbury, Conn.
Elmer Kiessling, American Fastener Co.
M. Kiessling, American Fastener Co., Waterbury, Conn.
R. N. Sizelove, Fred Gumm Chemical Co., Kearny, N. J.
Robert S. Leather, President Lea Mfg. Co., Waterbury, Conn.
Geo. Knecht, 132 W. Elm St., New Haven, Conn.
E. M. Brayton, American Fastener Co., Waterbury, Conn.
Dick Crane, Lea Mfg. Co.
W. A. MacDonald, Standard Tool Co.
Geo. Dubpernell, United Chromium Corp., Waterbury, Conn.
Andrew Garrett, Secretary of Boston Branch, A.E.S.
George Juke, Springfield, Mass.
Robert Mooney, Zapon Co., New Haven, Conn.
Roland Ducette, Frederick Gumm Chem. Co., Kearney, N. J.

ANDERSON, INDIANA. Anderson Branch of the A.E.S. held their meeting on Monday evening, Oct. 3, at the Y.M.C.A. A lunch was served previous to the meeting which was presided over by President L. R. Hinsch. The speaker was Mr. Walter Pinner of Detroit, who chose for his subject "Nickel Anodes", which was illustrated by lantern slides. Mr. Pinner was kept busy answering questions after his address until it was time for him to catch his train.

It was our first visit to Anderson and we were very much pleased at the type of men in the branch membership. They are nearly all young men, enthusiastic and sincere.

Mr. R. M. Wagner invited us to visit the Guide Lamp Company's plant in which he holds a very responsible position. Here bright nickel plating, chrome, and other electrodeposits are carried on in a large way. We appreciate Mr. Wagner's courtesy in giving us his time and the opportunity to see the work being done in such tremendous quantities under his supervision.

Mr. Wilhelm Castell then took us through the Delco-Remy plant, where much zinc plating is being done. During our visit here, we met one of the well known members of the A.E.S., Dr. Cotton. It was a pleasure to meet the Doctor again. Thank you, Mr. Castell, for your kind invitation.

We also met one of the men who was instrumental in the forming of the Anderson Branch, Mr. C. D. Cleaver, well known for his interest in the A.E.S. conventions. Dr. Merton Beckwith of Guide Lamp is another member it is always a pleasure to meet. Dr. Beckwith and Mr. Wagner presented the prize winning paper at the recent convention. We must not neglect to mention the new Secretary-Treasurer, Edgar McKinney, young and handsome, he seems to be an ideal man for the job. It was a delightful visit, the purpose of which was to meet the boys, ask them for papers for the REVIEW and give our advertising program their support.

TOLEDO. Toledo Branch meeting was held on Thursday evening, Oct. 6. President Stanley Moore called the meeting to order. After the usual business was taken care of by Secretary Bergemen, there was a general discussion on the work of the Society. A genuine feeling of satisfaction regarding the bound copies of the Proceedings was manifested. Mr. Walter Weiker mentioned his pleasant surprise that the copies could be printed and delivered in such a short time. Like a certain great American, we very modestly told him "we planned it that way".

Presenting papers for the REVIEW and advertising was discussed before the meeting adjourned. Refreshments were served and a social hour followed.

Having some time on our hands before the Toledo meeting, we boarded the bus for Adrian, Michigan, to visit the Gerity Whittaker factory. Mr. Ward Hunlock showed us through this busy plant and introduced us to some of the other plant officials. We were sorry to miss Mr. Gerity, Jr, who was out of town. Nice work is being done here on plating die castings.

Evidently the depression has had no effect on the Gerity Whittaker plant in Adrian.

Our good friend, Walter Weiker, former secretary of Toledo Branch, invited us to his home for supper on Wednesday night. We were pleased to meet Mrs. Weiker and their two girls, Phyllis and Marilyn. It's nice to have friends in a strange city. The Weiker's hospitality is deeply appreciated.

We left Toledo for Dayton on Friday, Oct. 7, after having a nice visit. Thank you boys and don't forget the papers and other things you promised for the REVIEW.

DAYTON. This was our first visit to Dayton Branch meeting and it was rather a surprise, although we wired the Secretary from Toledo. There was a fine attendance and a nice friendly spirit manifested. President Charles Conley opened the meeting with some pertinent remarks regarding the membership drive and other items, mentioning that five new members had been elected at the previous meeting.

Mr. Ed. Bucy of the Zapon Lacquer Co., Stamford, Conn. was the speaker of the evening and gave a fine talk on Duranite Finishes. Long discussions followed Mr. Bucy's talk and after the meeting was adjourned a sizeable group gathered round the speaker, whose fund of knowledge on lacquer finishes never seemed to be exhausted.

Copies of the proceedings distributed to the members of Dayton Branch were favorably commented on.

Past Supreme President of the A.E.S., Walter Fraine, has gone South again for the winter. Our best wishes for improved health go with him.

What a splendid place Dayton Branch has for their meetings in the Engineers' Club. A good meeting place is an incentive to get the members out. A poor one—well—that's different.

Dayton Branch, according to President Conley, has speakers scheduled for the remainder of the season. Good work on the part of the Librarian, Mr. H. C. Luchauer, accomplished this.

We were pleased to meet Mr. C. W. Powell, Sec.-Treas. of Dayton Branch. It's always well to know the persons you write to. Mr. Powell sends in interesting reports.

So we said good-bye to Dayton and left for home at 1:15 a.m. hoping to visit Cleveland on Saturday night, but found their meeting was the week previous, the first Saturday of the month. Better luck next time.

Arriving in Albany at 5:30 p.m. we found that train connections since the flood and hurricane were still off schedule, so took the Greyhound bus to Springfield, getting home at 9:30 p.m. after a journey that we hope will produce the results expected with the co-operation of our members.

PITTSBURGH. Mr. Stanley Hedden, Secretary of Pittsburgh Branch writes: We are trying to brace up our local Branch and believe we have started something that will put Pittsburgh back in the active list. Mr. R. O. Hummel has accepted the chairmanship of our Membership Committee. Mr. N. H. McKay, chairman of Program Committee. Mr. Louis Marini, chairman of Question Box. Two members have been elected: Mr. Dean E. McRory and Mr. Gaylord August Jersey. These men are on their toes and will be a valuable addition to the Branch.

TORONTO. Toronto Branch at their meeting, Sept. 25th, did a very gracious thing in electing Past Supreme President of the A.E.S., Walter S. Barrows an honorary member of the Branch. Mr. Barrows was elected as an honorary member of the Supreme Society at the Annual Convention in Milwaukee this year. Knowing Mr. Barrows, as we do, all we can say is these honors were not sought after, but are well deserved.

NEW HAVEN. On Thursday evening at Sterling Lab., Yale University, a large audience composed of members from Bridgeport, Waterbury, Hartford, and Springfield Branches, as well as several visitors, greeted Past Supreme President A. B. Wilson of Detroit as he spoke of the practical and technical issues involved in his work at the Chevrolet plant where he is employed. Mr. Wilson's paper was very interesting and instructive, at the conclusion of which he was given a rising vote of thanks. A long discussion followed the address. Two sound-motion pictures entitled "Tough Friends" and "Precisely So" presented by Messrs. Miller and Squire of the General Motors Corporation, lent added interest to the occasion.

Mr. Tom Chamberlain of New Haven Clock Co., introduced the speaker, Mr. Joseph Downes of the Remington Rand Co., our 3rd Supreme Vice-President, and also president of New Haven Branch, who spoke briefly concerning things of local interest, at the conclusion of the meeting. Another series of lectures on chemistry and its relation to plating is planned again this year at Sterling Lab.

WATERBURY. Mr. Fred Fulforth of Proctor Schwartz Co., Philadelphia, and 2nd Vice-President of the Supreme Society, spoke to the members of Waterbury Branch at their regular meeting on Friday night, Oct. 14. The speaker's specialty is plating on steel. He told of the obstacles to be overcome, the necessity of clean surfaces, the care of dies, and material to be fabricated, costs of the finished article, polishing, buffing, plating, etc. This was one of the most instructive papers we have heard for some time and was thoroughly enjoyed by the members. Long after the meeting was adjourned by the President, Louis Lougee of the Scovill Mfg. Co., Mr. Fulforth was kept busy answering questions by the members. We wish our treasury was full enough to send Mr. Fulforth to many of our branches to present this paper.

We are asking our members and friends to attend Waterbury Branch annual meeting and banquet Saturday, November 5.

NEWARK. The Newark Branch ladies are taking the convention seriously. They have held two meetings and a card party recently and are contemplating many similar affairs during the fall and winter months, in order to raise money enough to entertain all the ladies who attend the Asbury Park Convention. The committee is as follows: Chairlady, Mrs. Horace Smith; Secretary, Mrs. George Wagner; Treasurer, Mrs. Nelson Sievering. With this added assistance Newark Branch is bound to make an outstanding success of the annual meetings next year. Good luck to you girls! We hope to have your pictures in the REVIEW.

Business and Social News

BRANCH NEWS

Educational Activities

AMERICAN ELECTROPLATERS' SOCIETY

HARTFORD BRANCH

The Hartford Branch of the A.E.S. held its first fall meeting on Monday evening, Sept. 19, 1938, at the State Trade School in Hartford, Conn.

The meeting was called to order at 8:30 p.m. with President Pietro in the chair. Minutes of the previous meeting were read and accepted. All communications were read and placed on file. One member, Mr. H. C. Duggan, associate member, was granted a transfer to the Detroit Branch.

After the regular business of the branch had been transacted, Mr. Oscar Stocker, chief electro-chemist of the Seymour Mfg. Co., gave a very interesting talk on "Bright Nickel". His talk covered many of the different phases of "Bright Nickel" and many important things in connection with successful operation of them.

He very capably answered the many questions arising after his talk, and in conclusion was given a rising vote of thanks.

The meeting was attended by forty members and visitors and was adjourned at 10:15 p.m.

V. E. GRANT, *Sec.*

NEW HAVEN BRANCH

Nothing much has been happening in the New Haven Branch as the fall program has not as yet gotten under way. However, just to let you know that we are still alive, I'm writing you this short news letter. Our program gets off with a bang Thursday, October 13, with a lecture by Mr. A. B. Wilson, former national president of the A.E.S. Mr. Wilson's talk will be entitled "Electro-Plating and Metal Finishing in the Automotive Industry". This talk will be accompanied by a film entitled "Tough Friends" dealing with metallurgy, put out by the General Motors Corp.

The course in "Fundamental Principles and Theory of Electro-Plating" under the direction of Tom Chamberlain, will get under way Tuesday, October 25.

The sensational horse-shoe pitching team of Jack "Dead-Eye" Barry and Joe Sullivan captured the A.E.S. championship of Connecticut at Bob Leather's farm last Saturday. In the trap-shooting, Tom Chamberlain won further honors for the New Haven Branch by getting nine birdies out of ten. In the inevitable poker game Joe Downes got three lollapolluzzaz to capture high honors.

JOSEPH T. SULLIVAN, *Sec.-Treas.*

SPRINGFIELD BRANCH

The regular meeting of Springfield Branch was held at the Hotel Charles on Monday evening, Sept. 26th at 8:00 p.m. President Walter Barrus took charge. In the absence of the branch secretary, W. J. R. Kennedy acted in that capacity pro tem.

The regular order of business was transacted. First quarter Per Capita Tax was ordered paid. Mr. Frank J. Clark was elected chairman of the membership committee to work in conjunction with other branch chairmen under 1st Supreme Vice President R. M. Goodsell, to secure new members

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and increase the attendance at the meetings.

In accordance with a suggestion from Waterbury Branch that we have a regional meeting of all the New England Branches in the spring, Springfield voted in favor of having such a meeting. This event, if it can be made possible, will include an educational session and banquet.

A committee to report at the October meeting was appointed as follows: P. W. Prouty, C. Niles, W. Seidel, J. Costigan. This committee will recommend changes in the branch officers to conform with action taken at the regular meeting in April.

Mr. J. Allan Ferguson, Hampden Specialty Products Co., Easthampton, Mass., made application for active membership.

Mr. Eddie Gann of the Hanson Van Winkle Munning Company gave us a splendid talk on bright nickel solutions. A long and interesting discussion followed Mr. Gann's address. The speaker was given a rising vote of thanks, after which copies of the proceedings were distributed to the members present.

The meeting adjourned at 10:30 p.m.

W. J. R. KENNEDY, *Sec. Pro Tem*

PHILADELPHIA BRANCH

The Lancaster meeting was attended by some sixty-seven persons, about half of whom were members of the Philadelphia Branch, so that it is only necessary to collect six dollars from the other thirty odd present in order to increase our membership by that many and from the acquisitive gleam in our treasurer's eye that evening and the careful manner in which he preserved the names and addresses on the door prize checks, those individuals may just as well send in their dues before Bob Jackson goes to work on them; more especially so as the initiation fee of $5.00 is still held in abeyance for but a short time and by too long a delay the cost of joining may be eleven instead of six dollars.

Needless to say, Mr. Bucklees' motion picture on the diatom was well received, brought out some interesting discussion and instructed us in uses for diatomaceous earths never realized by the layman and our thanks are tendered to him and the Johns-Manville Company whom he represents in Philadelphia.

Mr. Sizelove's "Question Box" had to be called short due to approaching bus departure but was a spirited give and take most of the time and wandered far from the scheduled topic, finally winding up in the bright nickel field, upon which representatives of two proprietary solutions spoke briefly and the need was demonstrated for further knowledge of this new departure from the old established solutions.

Our librarian has decided to start from the beginning this year and since he says, "before you plate you have to clean" has scheduled Dr. William Stericker of the Philadelphia Quartz Company to address us on October 28th.

Dr. Stericker will plan to cover the subjects of alkaline detergents, their action on metals and their use in cleaning prior to electroplating. He will use lantern slides to illustrate some of the principles involved and may make table top demonstrations, while his seventeen years' experience spent directly upon detergent problems should assure of a good question period following his address.

In order to give a preview of the new annual meeting quarters, this address is scheduled for the Orchid Room in the WARWICK HOTEL, 17th and Locust Streets, Friday, October 28, 1938, at 8 p.m.

NEWARK BRANCH

The regular meeting of the Newark Branch A.E.S. was held on Friday evening, Sept. 16th, at the club room of the Hotel Douglas, Newark, N. J.

The meeting was called to order at 8:30 p.m. with President John Kotches presiding. Other officers present were: Jack Shamis, Vice-Pres.; George Wagner, Secretary; Nelson Sievering, Treasurer; Paul Oldam, Librarian; Stephen Leshnick, Sarg.-at-arms; William Harrison, Harmon S. Hunt and George Reuter, Trustees.

The minutes of the previous meeting were read and approved.

The following applications were received and voted to take the regular course: (1) Stanley Anderson Harris to Associate Membership (2) John R. Bricker to Associate Membership (3) Jules Homa to Active Membership (4) Siegfried G. Bart to Associate Membership.

This being the first meeting since July 15, 1938, Newark Branch members turned out with renewed enthusiasm. 62 members and visitors attended this meeting. Our Branch was honored by the presence of the following prominent men: Mr. George B. Hogaboom of the Hanson-Van Winkle-Munning Co. who was authorized at this point by our President to take the meeting over. Mr. Hogaboom then introduced Mr. Frederick Fulforth 2nd Vice President of the Supreme Society; Dr. William Blum of the Bureau of Standards, Washington, D. C.; Dr. Walter R. Meyer, General Electric Co.; and Mr. William J. R. Kennedy, our Executive Secretary. Each one of these men gave short interesting talks and were rewarded with hearty applause from the members.

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Mr. Horace H. Smith reported that he and the Secretary as a committee, had met the Committee of New York Branch, namely Mr. Franklyn J. MacStoker and Mr. Ralph J. Ligouri, to decide on the Newark-New York joint banquet. He stated that the date was to be February 18, 1939 and the place, Hotel Pennsylvania, New York. He also stated that New York Branch was desirous of having the Chairmanship of all committees, the Newark Committee to act as assistants. He asked the opinion of the membership regarding this request and it was decided this matter be left to the best judgment of the committee.

Mr. Paul Oldam, our Librarian, announced that he had scheduled a list of speakers for every meeting beginning October 7, 1938, and ending May 12, 1939. This schedule will be in

booklet form and will be ready for the members at the next meeting.

Mr. Oliver Sizelove, Chairman of the Membership Committee, asked the Secretary to read a letter which he had received from Mr. R. M. Goodsell, Chairman of the Membership Committee of the Supreme Society, stating that the quota for Newark Branch for this Fiscal Year was 30 new members. Mr. Sizelove urged all the members to assist in filling this quota.

Mr. George Reuter announced that the Chemistry Class would start meetings at the Boy's Vocational School, Sussex Ave. and First St., Newark, N. J. in October and that the members would be notified as to which nights they would meet.

Meeting adjourned at 11 p.m.

GEORGE WAGNER, *Sec.*

ANDERSON BRANCH

The regular dinner meeting of the Anderson Branch of the American Electroplaters' Society was held Monday, October 3, 1938, at the local Y.M.C.A.

President L. R. Hinsch presided and all other officers were present.

We were honored by the presence of Mr. W. J. R. Kennedy who gave a short talk in which he asked that new papers be written for the MONTHLY REVIEW since the "Proceedings" of the National Convention has reduced material that can be published. He also asked that we mention the REVIEW to purveyors who might logically advertise in it.

Mr. Walter Pinner, Chemical Engineer of the General Spring Bumper Corp., was the main speaker of the evening. He spoke on the "Importance of Proper Anode Corrosion in the Electrodeposition of Nickel". He illustrated the talk with lantern slides of various types of anodes both good and bad and under varying conditions. He presented the talk very well and many questions followed.

Meeting adjourned at 9:20 p.m.

E. L. MCKINNEY, *Sec.-Treas.*

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TORONTO BRANCH

Sept. 26—first fall meeting with President Acheson and 26 members settled down to hear the summer correspondence which kept Harry Hands busy for quite a considerable time. Seven new applications were received. Mr. Skelton transferred to Detroit Branch and four members were suspended. Mr. W. Graham read the Auditor's report which was well received and a motion of appreciation given to our secretary-treasurer, Mr. Hands. Books of the convention proceedings were distributed to the members present who voiced surprise at the way they were finished. The Books were far beyond the members expectations. Thanks to the Supreme Society. A telegram message was sent to Mr. Philip Sievering, congratulating him on his Golden Wedding anniversary. Archie Smith, Walter Barrows and Allen Byres were chosen as recommendation

committee for "Fume Exhaust System for Plating Rooms" to be compiled with other committees of the A.E.S. Lease expired on the old hall and the new meeting quarters will be in the King Edward Hotel. So come on you old timers, Tom O'Keefe, Jim Valiere and Harry Creswell, we will be looking for you in room G on the fourth Monday. Mr. John Acheson gave a talk on the old time plating of March, 1912, when W. Barrows, J. Acheson and W. Wells received the charter for Toronto Branch, and amidst one of the heartiest hand claps ever heard in this old hall, Mr. Walter Barrows was made an honorary member.

A new book cabinet was ordered for the Branch Library and Charley Kemish will hand out a list of all books to the members. The following papers were found in the question box:

Q. What is the time limit for nickel buffed articles to stand before chrome plating?

A. Members preferred to chrome plate same day.

Q. What is the thickness of nickel necessary to cover 180 *grease emery with occasional* 160 *marks on cold rolled steel?*

A. 1½ to 2 thousandths would be necessary or give a finer finish to the steel before plating.

Q. What would prevent zinc from depositing on the hard rubber contact ends of a plating barrel?

A. Give 2 or 3 coats of Glyptol cement.

Q. What causes green corrosion on anodes of Rochell salts copper Sol. with high current density?

A. Quite a discussion but no direct answer.

Q. What distance should articles be in cyanide copper still tank?

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A. Read article by Charles Kasper on Current Distribution, page 21, convention proceedings.

Meeting adjourned 11:30.

JAMES S. CAIRNS, *Rec.-Cor.*

ROCHESTER BRANCH

The Rochester Branch held its Sept. meeting on Friday night, Sept. 16, at the Seneca Hotel. This meeting was the first meeting since June and was very well attended. Regular business was disposed of quickly and then the meeting was turned over to our Educational chairman, Mr. Frank Dougherty, who started a discussion on grey iron castings. One point Mr. Dougherty brought out was of great significance to all platers of grey iron castings, the casting was first pickled in sulphuric acid pickle carefully rinsed and then plated with nickel and chrome. This plate to all appearances was very good and entirely satisfactory but under a heat test the plate all peeled off. A hydrofluoric acid pickle was then tried and there was no further trouble.

Mr. Boehm—I have a new sheet steel welded tank to be used for hot water rinse, before using however, I placed a Sodium Chromate solution in

it to pacify the steel. I left this solution in for 48 hours and then disposed of the solution. After only a few weeks of use I find the tank is all pitted, some of the pitholes being about 1-32 in. deep. What would cause this? There was quite a discussion on this, the concensus of opinion seeming to be that the solution either was not strong enough or not left in the tank long enough to pacify.

President DelRosso then introduced a visitor who was very well known to all of us, Mr. Wm. (Cyanide Bill) Schneider of the E. I. DuPont de Nemours Co., who favored us with a few words. Come again Bill.

Mr. Wm. Tucker and Mr. Gerald Lux then extended an invitation to all members to attend the American Electrochemical Society's convention to be held in Rochester on Oct. 13, 14 and 15.

After a little more discussion the meeting was adjourned.

JUDSON R. ELSTER, *Sec.*

BALTIMORE-WASHINGTON BRANCH

We have now arrived at the time when our fall meetings begin. The first regular meeting of the Baltimore-Washington Branch, A.E.S. will be held at the National Bureau of Standards, Washington, D.C., Saturday, October 1, 1938, at 7:00 p.m.

Your officers hope every member has had a very enjoyable summer and is now ready to go to work. We hope to have a big year. Yes, there will be lots doing. We have on a drive for new members and according to the new by-laws they should not be hard to get. The Librarian has planned many good speakers which each member should make it a point to hear. The Refreshment Committee will still continue to see that there will be the usual after meeting social hour.

The Secretary needs money and has enclosed a bill for your dues, please make an effort to bring them up to date.

The speaker for the evening will be Mr. M. R. Thompson. The subject will be "17 Years of pH".

IRVIN H. HAHN, *Sec.*

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NEW YORK BRANCH

The New York Branch held their September meeting on Friday the 23rd at their headquarters in the Hotel Pennsylvania. This was the last of their meetings of the summer schedule. Beginning with October the Branch will hold two meetings per month, at the first meeting an educational feature and the second a business meeting followed by a round-table discussion of metal finishing problems.

At the September meeting a report was had from the chairmen of several of the standing committees relative to the coming Fall and Winter activities. Dr. Young, recent instructor at Columbia University and the new librarian of the Branch, read a list of the scheduled

speakers for the season and the subjects they will lecture on.

The Banquet Committee reported progress and the Membership Committee reported on their prospects. The business meeting concluded with a series of questions turned over to the Librarian for discussion and which later stirred considerable interest among the forty-five members present.

There were two applicants elected to membership and a further receipt of two more applications for membership in the Branch.

The meeting was adjourned at 11 o'clock p.m.

F. J. MACSTOKER, *Sec.*

LOS ANGELES BRANCH

The regular monthly meeting of the Los Angeles Branch of the American Electroplaters Society was held September 14, 1938, at the Rosslyn Hotel. President Earl Coffin presided. Minutes and Financial reports of previous meeting were read and accepted. Bills were read and ordered paid. The application of Mr. Roger Sundmark was read and turned over to the board of managers.

Mr. M. D. Rynkofs, member of the research committee was asked to contact Dr. Blum and request a panel of assorted plated parts for exposure tests on the Pacific coast. Mr. Don Bedwell and Mr. E. R. Holman demonstrated rapid methods of analyzing cyanide copper solutions. Mr. Earl Coffin was elected Chairman of the Membership Drive and will be actively supported by Mr. Frank Rushton and Mr. C. E. Thornton.

Meeting adjourned at 11 p.m.

RAYMOND SOLIVAN, *Sec.-Treas.*

DETROIT BRANCH

The Sept. 9 meeting was called to order by the President, Mr. J. W. Higgins and there were about seventy-five members present. The minutes of the previous meeting were not read as they had been published in the June issue of the REVIEW. And there were twelve applications for new members; these were read and referred to the Board of Managers. A report by the

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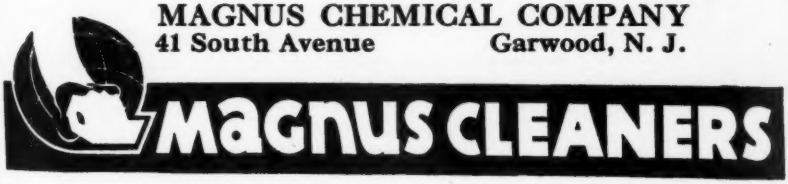

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0.001" in 10 minutes at 100% cathode efficiency

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Thickness of Deposit	TIME IN MINUTES			
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0.001"	26.4	17.6	13.2	10.6

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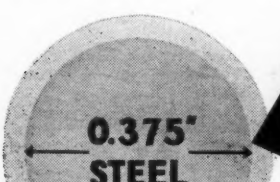

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For some articles, such as printing rolls, wire, rods, the process can be adapted to a current density of 100-200 A/SF. This heavy current deposits the copper very rapidly. Heavy weight smooth and bright coatings can be obtained to almost any desired thickness. Coatings up to 0.033" have been produced—a most unusual thickness for cyanide copper—*in as little as 2½ hours.*

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picnic committee was given. The report was that everybody had a grand time. Mr. W. M. Phillips, Supreme President of the Society was asked to give a talk on the convention which was held in Milwaukee, June 13-17. He gave a very good report of the business sessions, touched on the exhibits and educational sessions. Mr. A. B. Wilson made a motion that Detroit Branch have its Second Annual Educational Session, Dinner and Dance, at Hotel Statler, Saturday Dec. 10, 1938. This motion was seconded by Mr. Heussner and the motion was unanimously carried. The President appointed the committee, Mr. H. M. Cherry, as chairman. Mr. Charles Eldridge, chairman of the educational committee, Mr. W. Wilson and Chas. Beaubien in charge of tickets. Mr. Wm. McCord on program. Mr. A. B. Wilson, Mr. Carl Heussner, Mr. Geo. L. Nankervis, Mr. Chas. Anger, Mr. H. W. Kennedy, constituting the rest of the committee with our President J. W. Higgins, exc. officio chairman. Mr. Carl Heussner then as membership committee chairman gave a talk on the drive for new members. He appointed Mr. Brockway, (five), Mr. W. M. Phillips, (ten), Mr. Higgins, (five), Mr. Eldridge, (five) Mr. Cherry, (five), Mr. C. Kennedy, (five), Mr. Camel, (five), Mr. Southwick, (five), Mr. McAleer, (five), Mr. Marshall, (five), Mr. H. W. Kennedy, (five). The figure behind the names are the quota of new members they pledged. A vote of thanks was extended to Mr. B. F. Lewis for acting as chairman of the exhibit committee for the convention in Milwaukee and for the good work that he did in getting up the exhibit for the Detroit Branch.

The speaker of the evening, Mr. H. R. Norgren then proceeded with his paper on "Modern Developments in Vapor Degreasing". Illustrated with a motion picture film explained by Mr. George Walter. The paper was well read and the motion pictures were very interesting and educational. The questions and discussion on the paper and pictures showed that this subject was of unusual interest. A vote of thanks was extended these gentlemen for their efforts in presenting this paper and pictures. The Question Box was then taken charge of by Mr. Carl Heussner as our acting Librarian was absent. The questions were numerous and very interesting and will be published later in the REVIEW.

Meeting adjourned at 10:30 p.m.

T. C. EICHSTAEDT, *Sec.-Treas.*

DAYTON BRANCH

The regular meeting of the Dayton Branch was held at the Engineers Club on Friday, Sept. 9th.

This was our first meeting since June, and although it was still rather warm, was well attended and the number of new faces gave evidence that interest in the Society is growing.

Four associate members were elected under the ruling in the new Constitution, and several prospects were lined up for our next meeting.

Mr. Conley spoke of the membership drive being put on by the Society, and urged every member to consider himself a member of the membership committee and to turn in the names of any prospective members.

He also told of the happenings at the convention and congratulated the members on their exhibit which brought the Metal Industry Cup to Dayton, especially extending these congratulations to Mr. Leon Haas whose individual exhibit won highest honors.

At this time Mr. Luechauer introduced our speaker for the evening, Mr. Robert Wagner of the Guide Lamp

Division of General Motors Corp. who gave his paper on "Rochelle Salts Cyanide Copper Baths".

This paper was the Proctor Award winner at the convention in Milwaukee and brought out many interesting facts about this type of Cyanide Copper Bath.

At the close of the discussion following this paper Mr. Wagner was given a rising vote of thanks.

Many favorable comments were heard about the copies of the Convention Proceedings which were distributed immediately following our adjournment.

CORLISS W. POWELL, *Sec'y.*

GRAND RAPIDS BRANCH

Our last meeting was called to order by President Vlug and was held September 8th. The minutes of the previous meeting were read and approved. Communications were read and accepted. Mr. Charles Werft reported on his activities as Chairman of the Membership Committee, and at the same time turned in nine applications for membership in this Branch. The applications were turned over to the Board of Managers who later reported their approval and the applications were placed before the members for final action. It was then moved, supported and carried that the applications of the following persons be accepted: Abraham Vander Henst, Milton B. Hammond, Clarence Robison, Alfred Dyer Truman, Chester W. Smith, John Cole, Vernon Cobb Burr, Lawrence Herbert Seabright, John Edward Manning.

The educational activities of the Branch for the coming year were discussed at great length and resulted in the appointment of a committee of three — Mr. Homer Morton, Chair-

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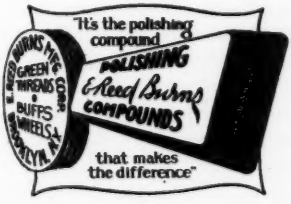

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man; Mr. Charles Werft and Mr. Clayton Beemer.

Our Social activities also came up for some discussion and the following members were appointed to serve on the Social Committee for the coming year; Mr. Morris Caldwell, Chairman; Mr. Herbert Guldbrandsen and Mr. Raymond Sperry.

The meeting was then turned over to the librarian for the good of the order.

CHAS. S. WHALLEY, *Sec-Treas.*

BINGHAMTON-ELMIRA BRANCH

A dinner meeting of the Binghamton-Elmira branch was held at the Cortland Hotel, Cortland, N. Y., on Friday, September 30. Just 50% of our membership turned out which was thought to be a good start for the Fall and Winter meetings.

This meeting was called to elect a new president and also to formulate plans for the new season. Mr. Wm. Maher of the Hunter Fan Company, Fulton, N. Y., one of our very active members was unanimously elected president.

It was suggested the name of the branch be changed to Binghamton-Syracuse branch, this to be taken up with the Executive Secretary.

There seemed to be a difference of opinion as to whether we should bring speakers as in previous years or have discussions amongst our own membership on our own every day problems. It was decided that after the first meeting in October when Dr. Walter Meyer will speak we would try the new plan of discussion.

It was decided that our meetings shall be held the last Friday of each month at the Cortland Hotel, Cortland, N. Y. This being about half-way between Syracuse and Binghamton.

One of our members is having considerable trouble with spotting out on silver plated brass reflectors. Any information on this would be appreciated.

Meeting adjourned at 10.30 P. M.

GEORGE SIMMONS, *Sec.*

MILWAUKEE BRANCH

The 291st regular meeting of the Milwaukee Branch of the A.E.S. was held on Thursday, October 6, 1938, at the Republican House.

President Dexter Rhodes called the meeting together at 8 p.m. Roll call of officers found them all present.

Minutes of the previous meeting were read and approved, and it was moved and seconded that all bills be paid. Moved and seconded that all communications be placed on file.

Mr. Jack Geissman, chairman of the Membership Committee, reports that some contacts for new members have been made, and that in a short time Milwaukee will show a goodly gain in membership. He also stated that every member must be made to realize that this is not a job for one man, but one for the entire Branch. There can be but one answer to the outcome of this membership drive, and that is success. This can only be accomplished by each and every member pulling together. This does not mean the active members who attend all the meetings, but also those men who live in the out-lying districts and distant cities. They in reality can do more for the Branch. They are in the position to acquaint their fellow workers with the advantages that can be obtained by belonging to the Society. So if you have a prospect, do not hesitate to write to your Branch Secretary for an application blank.

The Secretary has also been bonded for the sum of $2000. and the bond

was turned over to the Board of Managers.

The business meeting adjourned at 8:45 p.m. and the meeting was turned over to Mr. Henry Bornitzke, Librarian, who tells us that the plans for the class in Electro-Chemistry are progressing very nicely and it has been announced that Mr. Phil Ritzenthaler, one of our younger members, will teach it. Mr. Ritzenthaler is a chemist with the Cutler-Hammer, Inc.

The following questions were found in the Question Box:

Q. What causes a copper cyanide solution to plate dark streaks?

A. It lacks cyanide.

Q. In a hot nickel solution that contains 6 *ozs. Ni.*, 3 *ozs.* Cl_2, *some* H_3BO_3 *Temperature* 120, *how can the throwing power be increased? Work being plated in this solution is plated back to back. On face of work deposits* .001, *on sides,* .0005.

A. Decrease temperature, reduce metal content and increase plating time.

Q. What is a good activating solution for passive nickel?

A. Sodium Cyanide 10 ozs./gal. Room Temperature. Direct current 30 seconds.

Our speaker for the evening was Mr. Phil Ritzenthaler, who gave a talk on the "Use of the Current Density Meter". This paper was well worth hearing and very enlightening on several points in regards to the flow of current in solutions.

The meeting adjourned at 10:30 p.m.

ROBERT B. GOODSELL, *Sec.-Treas.*

PHILADELPHIA BRANCH

Meeting called to order by Pres. Joe E. Underwood; moved and seconded go into good and welfare, carried. Mr. W. J. Bucklee, sales manager, Phila. Dist. for Johns Manville Co., showed a talking moving picture of "Celite; the Story of the Diatom"; at conclusion of picture Mr. Bucklee gave a brief resumé of the uses of diamateous earth for filtering purposes. Moved and seconded Mr. Bucklee be given a rising vote of thanks, carried. Then our old friend, Mr. Oliver Sizelove of The Frederick Gumm Chemical Co., was introduced. He opened the Question Box and as you know Oliver had the answers.

Moved and seconded Mr. Oliver Sizelove be given a rising vote of thanks, carried. Then came the door prizes; won by Mr. W. A. Reynolds; J. W. Himes; C. Dillinger; H. C. Brubaker; F. Harper; B. E. Warner and R. Storer Jackson.

These applications were referred to the Board of Managers: H. C. Brubaker, active member; E. Light, active member; A. Hagen, active member; H. Jaffee, associate member.

The meeting was attended by a large representative group from Philadelphia who traveled by bus and their own cars. There were 81 present, 45 from Philadelphia. At the conclusion of meeting refreshments were served and all had a good time and there were comments that we should have more of these meetings.

Special Notice

The October meeting will be held at the "Hotel Warwick", October 28, 8:00 p.m. Reserve this date as it is going to be a large and important meeting. Also remember the banquet and educational session to be held November 19, 1938, 2:00 p.m. sharp.

ROBERT E. JACKSON, JR., *Sec.*

BOSTON BRANCH

Boston Branch met Thursday the 6th at the Bradford Hotel, Boston, at 8 p.m. with President DeLorme in the chair.

Minutes of the previous meeting read and approved.

Communications read, one of them from the Waterbury branch in regards to holding a meeting of all the New England branches. This was discussed later in the meeting and voted down because all the members attend our own yearly meeting, some would not be able to attend if held outside of Boston or Providence. All communications placed on file.

Bills read and moved that they be paid.

Two applications were received and read for the first time and turned over to the board of managers, as follows: George P. Swift, Massachusetts Institute of Technology, Cambridge, Mass., Associate, and Louis Tosi, 138 Rindge Ave., Cambridge, Mass., Associate.

A motion was made that an entertainment committee be appointed for the coming year, Bill Treadwell was named chairman and he will appoint his own committee.

Bert Sage made a report on the convention and says it was the best one he has yet attended but he says wait until Boston gets it, then he will say that it was the greatest ever. He explained the proceedings from start to finish and it was very interesting.

The chairman of the membership committee, Charlie Hardy, spoke on the drive being made to bring in new members and suggested that every member try and bring in a new member by the first of the year.

The Librarian, Arthur Mintie, spoke and stated that he will have a speaker for the next meeting, Mr. Fred A. Bowen, of Howe & French Co., Boston. His subject will be the "Value of the pH in Solutions", and asked all the members to try and support the branch by attending the meetings as he has arranged for speakers for all the coming meetings.

A general discussion was on for an hour, after which the meeting was adjourned at 10:30 p.m.

A. W. GARRETT, *Sec.*

BRIDGEPORT BRANCH

The regular monthly meeting of the Bridgeport Branch was held in the Chamber of Commerce rooms at the Stratfield Hotel on Friday, October 7, at 8 p.m. There were thirty members present. Joe Sterling, President, called the meeting to order. The minutes of the last meeting were read and accepted. Report of the Sick Committee, none.

A communication from the New Haven Branch informing our members of an Educational Program was read, and it is expected that many of the local men will be present on October 13 to hear Mr. Wilson. A communication from the Waterbury Branch concerning an Educational Session and Banquet was read and voted on by the members present. Mr. George Hogaboom also sent a communication asking for papers to be prepared to be read at the Convention. The Branch voted to offer prizes for the best papers that come in between now and April.

Good of the Order: After much discussion, the meeting night of the Bridgeport Branch will be changed, and the regular monthly meeting will be held on the first Thursday, instead of the first Friday. Dr. Walter Meyer, informed the members that the Chemistry Class would be organized again this year, early in November, a definite

time and place to be announced later. On Friday, Nov. 18, there will be an open meeting for discussions, and Mr. Geo. Hogaboom will again hold a Question Box period that proves to be very interesting.

Educational Session: Dr. Meyer conducted the Question Box, and Mr. Bernard Case spoke on Bright Nickel Solution. It seems quite evident that Dr. Meyer and Mr. Case are going to make our future sessions very interesting and inviting to members of other Branches whom we would like to have attend.

WILLIAM FLAHERTY, *Sec.-Treas.*

NEWARK BRANCH

The regular meeting of the Newark Branch, A.E.S., was held on Friday evening, Oct. 7, 1938, at the Club room of the Hotel Douglas, Newark, N. J.

Due to the fact that our President had a heavy cold the meeting was called to order at 8:30 p.m. by our Vice-President, Jack Shamis. Officers present were: John Kotches, President; Jack Shamis, Vice-Pres.; George Wagner, Sec'y; Paul Oldam, Librarian; Stephen Leshnick, Sarg.-at-arms; William Harrison, Harmon S. Hunt, and George Reuter, Trustees.

The minutes of the previous meeting were read and approved.

A letter was read from Mr. George B. Hogaboom, Chairman of the Educational Committee for the 1939 Convention. Mr. Hogaboom's letter was a request for a paper from each Branch to be read at this Convention. His letter was filed for future reference.

A letter from the American Standards Association with reference to drawing up a Code for Electroplating, was read and turned over to Mr. Oliver Sizelove.

The following applications were voted to take the regular course: William Finley Speer to Active Membership; Stephan Goda to Active Membership; Raymond Dooley to Associate Membership and S. O. Krivit to Associate Membership.

Mr. Horace Smith, General Chairman of the 1939 Convention, spoke about the coming convention, a bus trip to the Philadelphia Banquet and a Bingo Party by Newark Branch.

Mr. Paul Oldam, our Librarian, then presented Mr. Everett Ward who read a paper by Mr. Carl Johnson of the Oakite Products Co. The subject of the paper was "Contamination of Cleaners". This paper was very interesting as it dealt mostly with Chromic Acid Contamination in Cleaning Solutions and the effect it has on the articles to be plated. The contents of this paper will be forwarded to the MONTHLY REVIEW for publication. Mr. Ward was given a rising vote of thanks by the 52 members present. Meeting adjourned at 11 p.m.

GEORGE WAGNER, *Sec.*

ST. LOUIS BRANCH

Regular meeting of the St. Louis Branch, A.E.S., was held on Friday, Oct. 7, 1938. Dinner was served for 17 at 6:15 p.m.

In the absence of President and Vice-President, John Bogt, our Librarian acted as Chairman for the evening. Roll call of officers showed three absent. Minutes of previous meeting were read and approved.

Letter was read in regards to "Exhausts in Plating Room". Form sent with questions every one was urged to fill in question and return as it would help every one to solve the fume problem.

Chairman of Membership Committee stated he would go to work and try and have some new members, or reinstate some of the old ones. Meeting then was turned over to Librarian.

Bright nickel was the subject and there were samples that looked very good. Each one explained how the job was done and we all know a little more about bright nickel.

Next month the subject will be Cleaning and every one knows that we can all learn something about cleaning, so look back in your file and find some of the troubles you have had and bring it down to this meeting and there surely is someone that can help out.

We had two of our out of town members. Glad you came!

Nothing further, meeting adjourned to pool room to see who was Champion, and so Frank Terrio and Leo Freihardt took E. J. Musick and H. J. Richards to the tune of 2 games out of 3, so I suppose the battle will be on after our next meeting.

CHAS. T. MCGINLEY, *Sec.*

CLEVELAND BRANCH

The regular monthly meeting of the Cleveland Branch of the A.E.S. was held at Hotel Cleveland, Sat., Oct. 1, 1938.

Meeting called to order by our President, Mr. Matts at 8:30. Minutes were approved as read.

Application for membership was made by Mr. John S. Hoffman of the Udylite Co. of Detroit, Mich., associate member.

Mr. Elmer E. Binder of Puro Chemical Inc. of Cleveland, Ohio, associate member.

Mr. Merlin W. Woodruff of Eaton Mfg. Co. of Cleveland, Ohio, associate member.

Mr. H. E. Beshey of Shelby Spring Hinge Co. of Shelby, Ohio, active member.

Clambake committee reports progress.

Librarian reports he has speakers for the next four months and he asked everybody to attend these open meetings.

Meeting adjourned at 10:15 o'clock.

CHAS. F. OTT, *Sec.*

CHICAGO BRANCH

The regular monthly meeting of the Chicago Branch was held on Oct. 8, 1938, at the Atlantic Hotel.

President J. W. Hanlon presiding and all other officers present.

Mr. H. A. Gilbertson, Chairman of the banquet committee reported that the annual Chicago banquet will be held at the Palmer House on Jan. 28, 1939.

The meeting was then turned over to the librarian who found the following questions in the question box:

Q. How high an iron content is recommended for nickel plating solutions? Are there any bad effects due to too high an iron concentration in the baths?

A. In the high chloride bath high purity nickel anodes are recommended. Iron concentrations above 5 grams per liter will have a bad effect on nickel plating solutions.

Q. How can aluminum be plated with nickel and chrome?

A. This question was referred to Dr. H. K. Work's formulas on that phase of plating.

Q. What solution can be used to plate a piece of brass to match steel?

A. Iron chloride plating bath.

M. H. LONGFIELD, *Sec.-Treas.*

DETROIT BRANCH

Minutes of the meeting of Oct. 7, 1938. Our President, Mr. J. W. Higgins, presiding There were a hundred members present. Minutes of the previous meeting were read and approved.

There were twelve applications for membership reported favorably on by the Board of Managers and these were unanimously elected to membership. There were ten applications received and read and referred to the Board of Managers.

The correspondence from the following were read and the secretary instructed to reply to them: There were two from Mr. George Hogaboom, Chairman of the Program Committee of the International Convention which will be held at Asbury Park, New Jersey, next June. One of them was in regard to a Branch paper to be read at this convention. It was moved, seconded and carried that the Detroit Branch will not present a Branch paper at this convention. The other letter was in reference to the research committee of which he is also Chairman. It was regarding holding a meeting of the Research Committee some time in January in Detroit in 1939. It was decided in a committee meeting that we try to arrange this meeting for Dec. 9 or 11. This would fit in very nicely as we are to have our Annual Dinner Dance on December 10.

The President then thanked Mr. Hoefer for the excellent work he did in presenting our Branch paper at the Milwaukee convention.

Mr. Finn of the Cleveland Branch was a visitor at our meeting and he was asked to say a few words.

Mr. R. J. Amberg of the Johns-Manville Detroit Office was then introduced. His subject was "Celite Filter Aids". Illustrated by talking motion pictures describing the formation, mining and properties of the product. This talking movie was very interesting and educational. "Celite Filter Aids" are used as the subject implies, to aid in filtering solutions; and are better known to the plating trade by the name of "Hyflo-Supercel". Judging by the number of questions that were asked and the discussion it was a very interesting subject.

Mr. B. F. Lewis, our Librarian, then took charge of the Question Box. These questions will be answered later.

Meeting adjourned at 10:30 p.m.

THEODOR C. EICHSTAEDT, *Sec.-Treas.*

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Clean metal—100 percent is the prime factor in perfect plating jobs. PERMAG Cleaning Compounds get metal to that high state of cleanliness before plating. And because PERMAG is a fast, economical cleaning compound is the reason, shops both large and small use it. Have you a problem in metal cleaning? We would like to know about it.

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Mfrs. of Specialized Scientific Cleaning Compounds—Soaps, Solvents, Metals and Wiredrawing Compounds — for Every Industrial Purpose. WAREHOUSES IN PRINCIPAL CITIES. *Representatives from Coast to Coast. In Canada:* Canadian Permag Products Ltd. Ottawa & Queen Sts., Montreal, P. Q. ***Cable Address.*** **PERMAG, N. Y.**

DAYTON BRANCH

The regular meeting of the Dayton Branch was held at the Engineers Club on Friday, Oct. 7th.

A letter from Mr. Geo. Hogaboom concerning the Educational Program for the 1939 Convention was read. Action on this matter was postponed until our next meeting.

Mr. Kennedy, our Executive Secretary was present at this meeting and was introduced by Mr. Conley.

Mr. Kennedy discussed the MONTHLY REVIEW and some of the problems facing the Society in its publication.

Since the educational sessions of the future conventions are to be distributed to each member, material must be found to take the place of these papers in the REVIEW Mr. Kennedy asked the co-operation of the Branch Secretary in forwarding all available material to him for publication.

Every member can do his part by buying from companies that advertise in the REVIEW wherever this is possible.

Mr. Kennedy is to be congratulated on the fine work he has done on the REVIEW and I am sure he will have the support and co-operation of our members in the future.

Mr. Geo. Hogaboom was announced as our speaker for the next meeting and Mr. Cochran was appointed to arrange for refreshments after this meeting.

Mr. Luechauer introduced Mr. E. H. Bucy who gave a general discussion of Lacquer and Enamel Finishes. Mr. Bucy had quite a number of samples and the discussion following his talk was one of the best the Dayton Branch has heard for a long time, Mr. Bucy receiving a big hand at its close.

CORLISS W. POWELL, *Sec.*

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WATERBURY BRANCH

Thirty-seven members were present at the October Meeting to hear Mr. Fred Fulforth of the Philadelphia Branch speak on "Productive Preplating Methods". The talk was unusually interesting to all members present because more emphasis was placed on the difficulties which are encountered in the plating room from poor materials, poor handling and lack of cooperation between the Plating Department and other departments, rather than on the actual details of the solution, analysis, pickles, etc.

One thing which was quite surprising to many of us was that Mr. Fulforth changed the nickel plating from a standard nickel solution to a bright nickel solution in the midst of a twenty-four day production run on plated ware without a serious break in production. In view of the fact that many companies take weeks and in some cases months to change from one type of bath to another, we consider this to be quite a feat in planning and foresight. Many questions were asked of Mr. Fulforth after his talk and we believe this was one of the most outstanding talks we have had in a good many meetings.

We were pleased to have our Supreme Secretary, Mr. Kennedy, present with us and hope he will be here often this season.

Plans were announced for the coming banquet to be held November 5th, at the Hotel Elton, Waterbury. There will be a technical session at 2:00 in the afternoon, followed by a banquet, entertainment and dancing in the evening. All members and friends of the Electroplaters are invited and we can assure them of an instructive session in the afternoon and a good time in the evening. Tickets for the affair may be obtained in advance by writing to the Secretary of the Branch or may be obtained during the afternoon and evening of the banquet.

E. T. CANDEE, *Sec'y.*

DAYTON BRANCH PRESIDENT ACCEPTS NEW POSITION

Mr. Chas. C. Conley, who has been associated with the National Cash Register Co. for the past 15 years, in the Research and Plating Depts., has resigned from that organization, effective Oct. 8, 1938, to accept a position as plant manager with the Stolle Corporation, whose main office is located in Cincinnati, Ohio. Plants are located in Cincinnati, Dayton and Sidney, Ohio. Mr. Conley will be located at the Sidney plant where a new wing has been added, and extensive installations are being made in order to handle an entirely new and novel line of work.

Mr. Conley, president of the Dayton Branch for the past two years, will continue to reside at 2505 Catalpa Drive in Dayton.

SUPPLY PRICES, SEPTEMBER 29, 1938

ANODES

Prices, except silver, are per lb. f.o.b., shipping point, based on purchases of 2,000 lbs. or more, and subject to changes due to fluctuating metal markets.

Copper:	Cast	.20 per lb.
	Electrolytic, full size, 15c.; cut to size	.15 per lb.
	Rolled oval, straight, 15½c.; curbed	.16½ per lb.
Brass:	Cast	.18⅝ per lb.
Zinc:	Cast	.10 per lb.
Nickel:	90-92%, 16" and over	.45 per lb.
	95-97%, 16" " "	.46 per lb.
	99%+cast, 16" and over, 47c.; rolled, depolarized, 16" and over, 48.	
Silver:	Rolled silver anodes .999 fine were quoted Sept. 29, from 46c. per Troy ounce upward, depending on quantity.	

CHEMICALS

These are manufacturers' quantity prices and based on delivery from New York City.

Acetone C. P. l.c.l. Drums	lb.	.06¼
Acid—Boric (Boracic) granular, 99½+% ton lots	lb.	.054-.059
Chromic, 100 lb. and 400 lb. drums		16¾-.17¼
Hydrochloric (Muriatic) Tech., 20 deg. carboys	lb.	.027
Hydrochloric, C. P., 20 deg., carboys	lb.	.08
Hydrofluoric, 30%, bbls	lb.	.07-.08
Nitric, 36 deg., carboys	lb.	.06
Nitric, 42 deg., carboys	lb.	.07½
Sulphuric, 66 deg., carboys	lb.	.02½
Alcohol—Butyl, drums (f.o.b. destination)	lb.	.09½-.10
Alum—Lump, barrels	lb.	.0340-.0365
Powdered, barrels	lb.	.0355-.0380
Ammonia, aqua, com'l., 26 deg., drums, carboys	lb.	.02½-.05¼
Ammonium—Sulphate, tech., bbls	lb.	.03½-.05
Sulphocyanide, technical crystals, kegs	lb.	.55-.58
Arsenic, white kegs	lb.	.04½-.05
Asphaltum, powder, kegs	lb.	.23-.41
Benzol, pure, drums	gal.	.41
Borax, granular, 99½+%, ton lots	lb.	.027-.032
Cadmium oxide, 50 to 1,000 lbs	lb.	.95
Calcium Carbonate (Precipitated Chalk), U.S.P.	lb.	.05¾-.07½
Carbon Bisulphide, drums	lb.	.05¾-.06
Chrome, Green, commercial, bbls	lb.	.22
Chromic Sulphate, drums	lb.	.26¼
*Copper—Acetate (Verdigris)	lb.	.25
Carbonate, 53/55% cu., bbls	lb.	.15½
Cyanide (100 lb. kgs.)	lb.	.34
Sulphate, tech., crystals, bbls	lb.	.0495
Cream of Tartar Crystals (Potassium Bitartrate)	lb.	.20¼-.20½
Crocus Martis (Iron Oxide) red, tech., kegs	lb.	.07

Dextrin, yellow, kegs	lb.	.05-.08
Emery Flour (Turkish)	lb.	.07
Flint, powdered	ton	30.00
Fluorspar, bags	lb.	.03½
*Gold Chloride	oz.	$18¼-23
*Gold Cyanide, Potassium 41%		$15.45
*Gold Cyanide, Sodium 46%		$17.10
Gum—Sandarac, prime, bags	lb.	.50
Shellac, various grades and quantities	lb.	.31
Iron Sulphate (Copperas), bbls.	lb.	.016
Lead—Acetate (Sugar of Lead), bbls.	lb.	.10-.12¾
Oxide (Litharge), bbls.	lb.	.12¾
Lime Compositions for Nickel	lb.	.09½-.11
Lime Compositions for Brass	lb.	.09½-.11
Mercury Bichloride (Corrosive Sublimate)	lb.	$1.58
Methanol, (Wood Alcohol) Pure, drums l.c.l.	gal.	.40½
Nickel Carbonate, dry bbls.	lb.	.36-.41
Chloride, bbls.	lb.	.18-.22
Salts, single, 425 lb. bbls.	lb.	.13½-.14½
Salts, double, 425 lb. bbls.	lb.	.13½-.14½
Paraffin	lb.	.05-.06
Phosphorus—Duty free, according to quantity	lb.	.35-.40
Potash Caustic Electrolytic 88-92% broken, drums	lb.	.07¼-.08⅝
Potassium—Bichromate, casks (crystals)	lb.	.09¼
Carbonate, 98-100%	lb.	.06¾
Cyanide, 165 lbs. cases, 94-96%	lb.	.52½
Pumice, ground, bbls.	lb.	.03
Quartz, powdered	ton	$30.00
Rosin, bbls.	lb.	.04½
Sal Ammoniac (Ammonium Chloride) in bbls.	lb.	.05-.07½
*Silver—Chloride, dry, 100 oz. lots	oz.	.40¼
Cyanide, 100 oz. lots	oz.	.43
Nitrate, 100 ounce lots	oz.	.35
Soda Ash, 58%, bbls.	lb.	.0235
Sodium—Cyanide, 96% minimum, 100 lb. drums	lb.	.15
Hyposulphite, kegs, bbls.	lb.	.03½-.06½
Metasilicate, granular, bbls.	lb.	3.15
Nitrate, tech., bbls.	lb.	.029
Phosphate, tribasic, tech., bbls.	lb.	.03
Silicate (Water Glass), bbls.	lb.	.01½
*Stannate, drums	lb.	.30-.32
Sulphocyanide, drums	lb.	.30-.35
Sulphur (Brimstone), bbls.	lb.	.02¾
*Tin Chloride, 100 lb. kegs	lb.	.35½
Tripoli, powdered	lb.	.03
Trisodium Phosphate—see Sodium Phosphate.		
Wax—Bees, white, ref. bleached	lb.	.60
Yellow, No. 1	lb.	.45
White Silica Compositions for Brass	lb.	.07½-.10
Whiting, Bolted	lb.	.02½-.06
Zinc—Carbonate, bbls.	lb.	.14-.15
Cyanide (100 lb. kegs)	lb.	.33
Chloride, drums, bbls.	lb.	.065
Sulphate, bbls.	lb.	.04

* Subject to fluctuations in metal prices.

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The Abstract Section

FREDERICK FULFORTH, *Chairman, Program and Educational Committee*

Electrolytic Tinning from Acid Solutions. By F. MARSHAK. *Vestnik Metalloprom* **16,** No. 10, 84-9 (1936). The constituents of tinning baths can vary as to amount within rather wide limits. The following composition is suitable: 7-10% $SnSO_4$, 5-7% H_2SO_4, 0.1-0.2% glue, 0.3-0.7% *m*-cresol, and 5-8% $Na_2SO_4 .10H_2O$. The *m*-cresol may be entirely replaced by phenol. Cresolsulfonic acid can be used only within a narrow concentration range. The presence of KF, NaCl, pyrogallol and colloids such as albumin, gelatin or gum arabic is injurious. Upon investigating the cause of polarization, no noticeable effect of glue or other capillary active material on cathodic polarization could be detected. M. G. MOORE

Chemical Abstracts **32**, No. 17, 6553 (1938).

Chromium-Plating, Particularly Black Chromium Deposits. By KURT ARNDT and HEINZ ENDRASS. *Z. Metallkunde* **30**, 21-4, (1938). The best conditions for laying down a black chromium deposit were found to be with an electrolyte containing between 250 and 400 g./l. CrO_3 and 5 cc./l. glacial acetic acid, temperature kept below 25° C. (77° F.) and a c.d. between 80 and 100 amp./sq.dm. (740-929 amps./sq.ft.). The cathode reaction of this electrolyte was about midway between that of an electrolyte containing only CrO_3 and one to which sulfate had been added. The black deposit contains about 75% metal and 25% metal oxide.

GERHARD DERGE, *Chemical Abstracts* **32**, No. 17, 6553 (1938).

Chromium-Plating of Steel Mill Rolls. By YA. GALLAI. *Novosto Tekhniki* **1938**, No. 10, 9-10. Rolls are polished, washed with gasoline, and several times with hot water. They are then chromium-plated at 45-7° C. (114-117°F.) in CrO_3 250 g./l. H_2SO_4 2-2.5 g./l. at 15 amp./sq.in. The thickness of chromium should be 0.02 mm. (.00008"). After plating the roll should be heated to 150° C. (300° F.). Chromium plated rolls have twice the wear resistance of ordinary rolls. A. A. PODGORNY

Chemical Abstracts **32**, No. 17, 6553 (1938).

Chromium Plating with Baths Containing Fluorides. By D. P. ZOSIMOVICH and E. I. KIRICHEUKO. *Mem. Inst. Chem., Acad. Sci. Ukrain. S.S.R.* **4**, No. 3, 277-90 (1937). The baths contained 250 and 350 g./l. CrO_3. Fluorides were added in the form of NH_4F, NaF or KF in amounts of 0.2-1.8 g./l. C.ds. were 2, 4, 6 and 10 amps./sq.dm. and the respective voltages were 2.8-3.0, 3.0-3.1, 3.1-3.3, and 3.3-3.5 v. Temp. was 20 and 25° C. Addition of NaF, NH_4F or KF had the same effect. Change in CrO_3 from 250 to 350 g./l. did not affect the quality of the deposits. At a c.d. of 2-4 amps./sq.dm. and a concentration of 0.8-1.6 g. HF/l., and at 6 amp./sq.dm. and a

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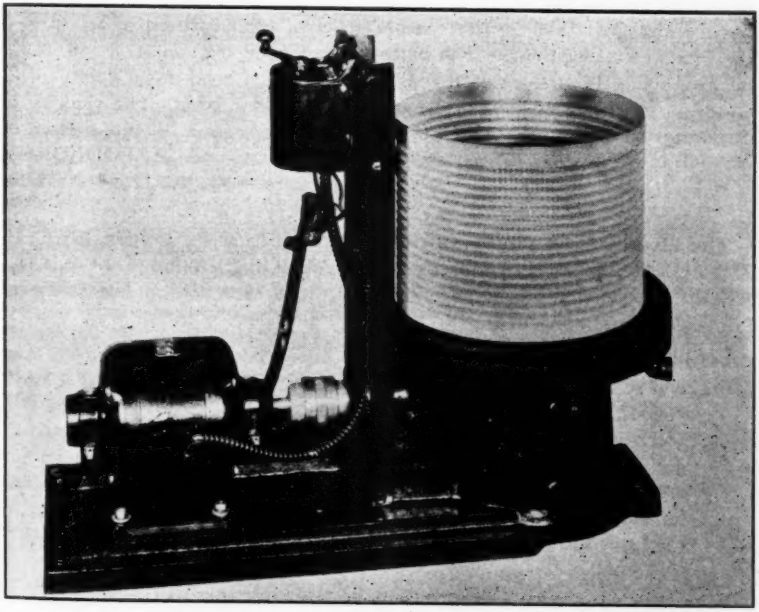
Marked improvement has been effected in centrifugal drying of metal products and parts by a new development in the Mercil type centrifugal dryer made by the Hanson-Van Winkle-Munning Co., Matawan, N. J., manufacturers of electroplating equipment and supplies. As shown in the illustration, the new construction includes a Garden City blower, direct connected to a $\frac{1}{4}$ H.P. motor. A 6″ pipe line is welded to the cover and extends over to the blower to a point where it can swing out in a horizontal position. The cover is simply lifted and swung out of the way in order to load and unload the basket of work. Electric heating elements are inserted in the pipe line directly above the opening in the cover.

The effect of this combination of Mercil Dryer and electric drying unit is to dry a batch of 30 to 60 pounds of small work in one or two minutes.

An interesting feature of this unit is the absence of vibration, even with the loaded baskets spinning at 600 R.P.M.



X5376.

Mercil Type Centrifugal Dryer running at 600 r.p.m. Note the absence of vibration.

concentration of 1.4-1.6 g. HF/l. good plating was obtained. Addition of 0.5, 1.0, and 2.0% H_2SO_4 limited the production of good deposits to a HF concentration of 1.3 g./l. and a c.d. of 4 amp./sq.dm. only. Chromium plating of copper, nickel, and brass proceeded well at 1.0-1.4 g. HF/l. and a c.d. of 2-4 amps./sq.dm. The deposits resisted moist air and 3% NaCl much better than those from a CrO_3-H_2SO_4 bath. B. Z. KAMICH

Chemical Abstracts **32**, No. 14, 5308 (1938).

Carbonates in Copper Cyanide Baths. By P. S. TITOV and E. N. TIMOKHINA. *J. Applied Chem.* (U.S.S.R.) **11**, 35-41 (1938). Six solutions were prepared containing CuCN (as $Na_2Cu(CN)_2$) 89.57, NaCN (free) 8.7 and Na_2CO_3 14.3-147.7 g./l. All experiments were carried out at 25° C. The electrical conductivity of the solutions increased with an increase of the carbonate content and then after passing through a maximum gradually diminished. The solutions containing 50-100 g./l. Na_2CO_3 had the highest electrical conductivity (0.1729 mhos). The cathode current efficiency in all solutions decreased with increase of the c.d. However in the solutions containing carbonate 50-100 g./l., the decrease of the yield was relatively slight, and at a c.d. of 1 amp./sq.in. the yield was around 90%. For practical purposes the cathode polarization is independent of the carbonate concentration. The passivity of the anode was not removed with the increase of Na_2CO_3 concentration but the nature of the film covering the anode and rendering it passive changed; thus at the concentration of carbonate equal to 70 g./l. the film was transparent. The bath recommended by Pan (*C.A.* **30**, 8037) but containing 10 g./l. more of free NaCN yielded a good metal deposit with a current efficiency of 90% at a c.d. of 1.0-1.5 amp./sq.in. The velocity of carbonization of the bath with CO_2 of the air decreased with the increase of Na_2CO_3 concentration. Three references. A. A. PODGORNY

Chemical Abstracts **32**, No. 12, 4440 (1938).

The Electroplating of Platinum and Palladium on Copper. By O. E. ZVYAGINTSEV, L. K. AMOSAVA, A. V. VOROB'EVA and N. M. KHANANOV. *J. Applied Chem.* (U.S.S.R.) **10**, 1969-78, (1937). The following formulas are recommended:

For platinum-plating on copper:

(a) H_2PtCl_6 4 g./l.
Na_2HPO_4 100 "
$(NH_4)_2HPO$ 20 "
NH_4Cl 25 "
c.d. 1 amp./sq.in. 70-80° C. for 3-4 min. The thickness of the layer formed was 0.1-0.14 ₱/sq. in.

(b) $Pt(NH_3)_2(NO_2)_2$ 10 g./l.
$NaNO_2$ 100 "
c.d. 1-2 amps./sq.in. 70-80° C. for 2 min. Recommended for very thin plates (0.04₱/sq.in.)

For palladium-plating on copper:

(a) Pd (as H_2PdCl_6) 1.2 g./l.
$(NH_4)_2HPO_4$ 20 "
Na_2HPO_4 100 "

(b) $Pd(NH_3)_2(NO_2)_2$ 10.7 g./l.
NH_4NO_3 100 "
NH_4OH 25 "

Announcement

THE NEW YORK AND NEWARK BRANCHES

wish to announce concluding arrangements for the holding of a joint

EDUCATIONAL SESSION ON THE AFTERNOON OF SATURDAY, FEBRUARY 18th, 1939

To be followed by a BANQUET-DANCE and SOCIAL HOUR in the evening

In the SALLE MODERNE and ROOF GARDEN of THE HOTEL PENNSYLVANIA

7th Ave. & 33rd St., New York City

In resuming their Annual Technical Sessions and Banquets, New York Branch is happy to join with our Brother Branch of Newark in furthering the Educational and Social activities of the A.E.S. and hope to have the active interest and attendance of the Electroplating Fraternity and the Metal Finishing Industry.

Ralph J. Liguori, President, N.Y. Branch John Kotches, President, Newark Branch

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NH_4Cl 25 g./l.	c.d. 0.75 amp./sq.in. 20° C. for
c.d. 0.25 amp./sq.in. at 20° C.	1-2 min. Thickness up to 5
for 2 min. Thickness 0.04	₱/sq.in.
₱/sq.in.	

A. A. PODGORNY, *Chemical Abstracts* **32**, No. 14, 5309 (1938).

Testing Oxidized (Anodized) Coatings. By W. BAUMANN. *Metall-Wirtschaft* **17**, 236-8 (1938). A chemical method for quantitatively measuring the value of oxidized aluminum is described. The oxidized sheet was exposed 7-13 min. to the electrolytic action of 3-5% barium chloride solution; the hydrogen developed was measured and plotted as a function of the duration of the test. C. B. JENNI

Chemical Abstracts **32**, No. 14, 5309 (1938).

Brighteners in Silver Plating Solutions. By B. EGEBERG and N. E. PROMISEL, *Trans. Electrochemical Society*, **74**, (Preprint 13) (1938). Reactions of carbon disulfide in the typical silver bath are formulated, and the reaction products were tested for brightening action, in a typical cyanide silver solution. High concentrations (5 oz./gal.) of thiourea, urea, potassium thiocyanate, and thiosemicarbazide were effective; cyanamide, guanidine, cyanuric acid, and methyl amine were of no value. The effect of solution composition and conditions on brightness of deposit is reported. From this work it was concluded that a brightener should have a structure of the type CS_x (NA)(NB), where x is 1 or 2, and A or B are hydrogen or hydrocarbon groups. Three compounds of this structure gave deposits of mirror brilliance, and other similar compounds were also effective to some degree. The optimum concentration is very small, and these compounds are suggested as the actual brighteners in the customary baths. The thiourea brighteners are, however, regarded as more desirable. Brightening is probably due to modification of crystal growth by sub-microscopic silver sulfide. ERNEST H. LYONS, Jr.

Ammonia in the Electrodeposition of Brass. By L. C. PAN, *Trans Electrochemical Society* **74**, (Preprint 9) (1938). 18 pp. graphs. Ammonia (0.2-2.4 g./l.) was added to the following baths: copper cyanide 4.2, free sodium cyanide 1.4-1.7, zinc cyanide 0.53 to 5.4 sodium carbonate 4.2 oz./gal. The copper : zinc ratio in the baths was varied by adding differing amounts of zinc cyanide. Temperature 68-72° F., c.d. 0-50 amps./sq.ft. In every case, ammonia markedly improved the color and brightness of the brass electrodeposit, although it did not affect the pH. For any copper : zinc ratio from 1:1 to 10:1, bright yellow deposits were obtained within a certain range of ammonia concentration. The higher ammonia concentrations were required by the higher copper : zinc ratios and gave good deposits over broader variations of these ratios. Ammonia raised the cathode efficiency 10-12%, approaching 100% in some cases, and permitted the use of higher c.d. Even deposits with identical colors varied widely in composition with changing c.d. and copper : zinc ratio in the bath, but ammonia suppressed these variations, the composition of the deposited alloy tending towards 50-60% copper regardless of

NEWARK BRANCH
A. E. S. EDUCATIONAL PROGRAM
FOR 1938-1939

October 7, 1938

Paper by Carl Johnson, Oakite Products Inc., New York, N. Y.
To be read by E. Ward.
Subject: To be announced.

October 21, 1938

Harmon S. Hunt, S. S. White Dental Mfg. Co., Prince Bay, Staten Island, N. Y.
Subject: *Wetting Agents in Nickle Plating Solutions.*

November 4, 1938

Dr. Walter R. Meyer, General Electric Co., Bridgeport, Conn.
Subject: *The Role of Metals as Brighteners and Impurities in Plating Solutions.*

November 18, 1938

Nathaniel Hall, Consultant Chemical Engineer, Newark, N. J.
Subject: *Industrial Plating Applications.*

December 2, 1938

Dr. Louis Weisberg, Louis Weisberg Inc., New York, N. Y.
Subject: *Methods of Purifying Nickle Plating Solutions.*

December 16, 1938

Frederick Fulforth, Proctor & Schwartz, Inc., Philadelphia, Penn.
Subject: *Constructive Pre-Plating Methods.*

January 6, 1939

Official opening of the 1939 Convention Year. Speaker, George B. Hogaboom, Hanson-Van Winkle-Munning Co., Matawan, N. J.
Subject: *Production of Special Finishes.*

January 20, 1939

Oliver J. Sizelove, Frederick Gumm Chemical Co., Kearny, N. J.
Subject: To be announced.

February 3, 1939

Dr. B. Brenner, Sigmund Cohn Inc., New York, N. Y.
Subject: *Metallurgical and Chemical Aspects of Electroplating Precious Metals.*

February 17, 1939

Gustaf Soderberg, The Udylite Company, Detroit, Michigan.
Subject: To be announced.

March 3, 1939

Franklyn J. MacStoker, A. Robinson & Son, New York, N. Y.
Subject: *Electro Deposits on Glass Reflectors and Mirrors.*

March 17, 1939

R. O. Hull, E. I. DuPont de Nemours Co., Grasselli Chemicals Dept., Cleveland, Ohio.
Subject: To be announced.

April 7, 1939

Paul A. Oldam, E. Poeter & Co., Irvington, N. J.
Subject: *The Cyanide Radical in Gold Plating Solutions.*

April 21, 1939

Dr. Edw. B. Sanigar, Temple University, Philadelphia, Penn.
Subject: *The Electroplater Sometimes Tells the Truth.*

May 5, 1939

Louis Dunroe, Pyrene Mfg. Company, Newark, N. J.
Subject: To be announced.

May 19, 1939

George Reuter, American Can Company, Newark, N. J.
Subject: To be announced.

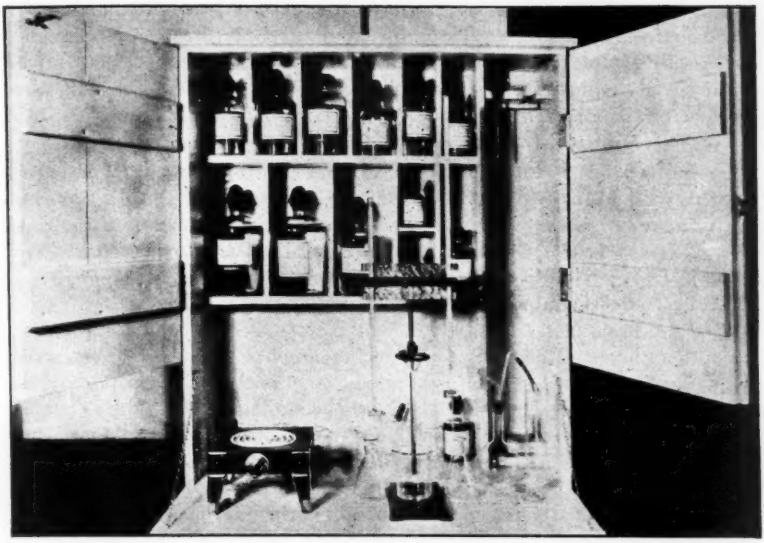
c.d. or metal ratio in the bath, if sufficient ammonia was present. The high-copper deposits were obtained from the low-copper baths. The cathode efficiency was lowered by increasing the copper : zinc ratio, partly because the free cyanide : total metal ratio was decreased. The effects of ammonia are attributed to the formation of a hypothetical copper-ammonia-cyanide complex. ERNEST H. LYONS, JR.

Electrodeposition of Chromium from Trivalent Salt Solutions. By W. H. WADE and L. F. YNTEMA, *Trans. Electrochemical Society* **74,** (Preprint 26) (1938) 6 pp., graphs. Chromium was electrodeposited from solutions of chromic sulfate containing ammonium sulfate. In cathode efficiency (less than 21%) quality of plate, throwing power, and reproduceability of results, no advantage was found over the customary chromic acid bath. Citric acid and ammonium oxalate additions lowered the cathode efficiency markedly but improved the deposits. Some deposits compared favorably with those from the chromic acid bath, but were active instead of passive. (Note: It would be interesting to know if these active deposits remain bright, or by tarnishing afford galvanic protection to steel as do zinc and cadmium, and as would be predicted from the potential of the chromium electrode.—E.H.L. Jr.) The effect of varying concentrations of ammonium sulfate, citric acid, and ammonium oxalate, and c.d., time of plating, temperature, and pH are illustrated by graphs. The best deposits were obtained from the following bath:

Chromium sulfate, $Cr_2(SO_4)_3 .15H_2O$	0.5 *M*/l.	40	oz./gal.
Ammonium sulfate, $(NH_4)_2SO_4$	4.0 "	70	"
Citric Acid, $C_6H_5O_7$	0.1 "	2.6	"
Ammonium oxalate, $(NH_4)_2C_2O_4 . H_2O$	0.1 "	1.7	"

C.d. 115 amps./sq.ft., temp. 95° F., pH 2.0, cathode efficiency 8%. The ammonium sulfate forms a complex which reduces and buffers the concentration of chromium ions, as is shown by titrations and e.m.f. measurements. The organic acids are believed to have a similar effect. This permits the deposition of chromium without precipitation of basic chromium salts.
ERNEST H. LYONS, JR.

Corrosion of Silver Anodes in Potassium Silver Cyanide Solutions. By A. E. THURBER, DANIEL GRAY and R. H. SHULTZ, *Trans. Electrochemical Society* **74,** (Preprint 20) (1938). 13 pp., illus. Troubles encountered with silver anodes in commercial silver plating, and correlation with their grain size and impurities are discussed. In continuous plating, anodes frequently corrode only in certain areas, while other regions remain unattacked unless pretreated in a vapor degreaser using trichlorethylene. By adding manganese to silver anodes, the undesirability of this impurity, at least in large percentages, was demonstrated. The dark coating formed on anodes in commercial silver plating consists largely of metallic impurities not readily soluble in the plating solution (Pb, Fe, Bi, Mn, etc.). Anodes containing relatively high lead and bismuth accumulated a rather loose black sludge, which when floating in the bath, gave rise to striking thread-like defects on the cathode, pictures of which are shown. The "thread" gave a chemical test for iron and a trace of manganese, indicating that sludge from the anodes was included in the



Complete Test Kit for analyzing alkaline zinc plating solutions

ANALYTICAL TEST KIT FOR ALKALINE ZINC SOLUTIONS

An Analytical Test Kit made by the Hanson-Van Winkle-Munning Co., Matawan, N. J., manufacturers of electroplating equipment and supplies, is described as "a complete laboratory for the analysis of cyanide zinc solutions." The outfit consists of all of the chemical solutions and apparatus necessary for making the analysis, arranged in a suitable cabinet. The cabinet when closed is dust-tight and can be locked. When the two doors are open and the bottom portion lowered, the bottles of solution are within easy reach, and ample working space is provided.

Solutions are analyzed according to the methods given in the booklet "Simple Methods of Analyzing Plating Solutions" issued by the Company. These methods are standard, simplified and shortened but, nevertheless, accurate and reproducible. Anyone, regardless of previous experience, can learn in a few hours to control plating solutions by these methods.

The solutions are carefully standardized and contained in chemically resistant glass-stoppered bottles. The proper factors given on the labels convert readings directly into ounces per gallon of the particular constituent sought. Refills are obtainable at moderate cost.

The parts of apparatus (beakers, burettes, funnels, etc.) to be subjected to heat, are made of pyrex glass.

The cabinet occupies but a small space and can be stationed in any convenient place or even in the plating room if desired. By simply opening the cabinet the equipment is ready for operation.

It is only by controlling a bright or regular zinc solution that consistent results can be obtained. Having all materials necessary for the analysis in one cabinet is conducive to regular and frequent analysis.

thread and probably caused it. "Extremely small amounts of impurities have marked effects upon silver anode corrosion, particularly the presence of metals not readily soluble in KCN (solution) . . . Likewise the physical structure of the silver . . . has a direct bearing on corrosion." Effects of solution composition, etc., were not investigated. ERNEST H. LYONS, JR.

Determination of Pores and Mechanical Imperfections in Protective Coatings on Light Metals by Anodic Deposition of Organic Coloring Material. *Bestimmung von Poren und mechanischen Verletzungen in Schutzüberzügen auf Leichtmetallen durch anodische Abscheidung organischer Farbkörper*). By V. DUFFEK, *Zeit. für Metallkunde*, Vol. **30,** August 1938, pp. 265-267. To develop a porosity test not involving chemical attack or destruction of the basis metal (limited to light metals such as aluminum alloys), the authors investigated indicators showing specific colors in solutions made weakly acid by change in pH due to anodic treatment of the test piece, using an aluminum cathode. Found that by using solutions of alkali metal salts of azo or sulfonated aromatic dyes (such as sodium salt of alizarin sulfonic acid), to which appropriate basic compounds (amines) had been added, a few seconds anodic treatment of the test piece resulted in deposition of adherent coloring material at the site of pores or other discontinuities that penetrated the coating to the basis metal. The test piece could then be washed and dried and the colored spots and areas examined leisurely or photographed. Applicable to anodic coatings, resin or Bakelite varnish coatings, and even metal coatings, e.g., chromium. Deposition of coloring matter due to electrophoretic action and ability of metal hydrate freshly produced on anode to adsorb the dye stuffs. In special cases, method works for basis metals of platinum, copper, tin and iron also. Color can be removed by brushing with water if it is desired to use test piece again. N. E. PROMISEL.
Chemical Abstracts, March 10, 1938, **32,** 1582 f.

Electroplating White Gold. By E. RAUB and K. BIHLMEIER, *Mitt. Forsch.-Inst. Probieramts Edelmetalle staat. höheren. Fachscule schwäb. Gmünd* **11,** 59-65 (1937). White gold can be deposited by adding nickel to a gold solution, 1 g. gold, 1-5 g. nickel, 4-23 amps./sq.dm. (37-214 amps./sq.ft.). Deposits with about 15% nickel have a fine white color. Gold-Tin alloys may be obtained from a gold bath containing potassium stannite, K_2SnO_2. Even up to 30% tin, these alloys show a yellowish tint. White gold is being plated on a commercial scale.

Penetration of Electrolytic Cadmium Deposits into Iron. By G. S. VOZDVIZHEUSKII and L. A. BRAUINA. *J. Applied Chem.* (*U.S.S.R.*) **10,** 1173-7 (1937). An intermediate layer of cadmium-iron alloy was detected between the basis metal and cadmium deposits from both acid and cyanide baths.

Perfect and Defective Anodized Coatings. By E. KÄPERNICH, *Aluminium* **19,** 753-6 (1937). Defective anodized aluminum coatings are often too thin; they should be at least 8-10 microns (.0003 to .0004 inches) thick; properly coated aluminum has practically an unlimited life.

ANNOUNCEMENT

Detroit, Michigan, November 1—Announcement was made here this week of the formation of the Bright Nickel Corporation, incorporated under the laws of the state of Michigan.

The Bright Nickel Corporation has purchased the American and Canadian patents for the bright nickel process formerly owned by the Schloetter Process Corporation, of New York. It has also purchased the patents and patent applications owned by the Pyrene Manufacturing Company of Newark, New Jersey, and the Parker-Wolverine Company, of Detroit, Michigan.

The officers and directors of the new company are as follows: Charles H. Aukerman, of Detroit, president; Richard G. Auspitzer, Schloetter Process Corporation, vice president; Luis E. Eckelmann, Pyrene Manufacturing Company, vice president; W. M. Hawkins, Parker-Wolverine Company, Detroit, secretary-treasurer; and John Scofield.

The company will engage primarily in licensing the "bright nickel" process to manufacturers using nickel plating as an intermediate or final finish.

To handle the licensing, the Bright Nickel Corporation has made a sales agreement with a number of leading chemical firms. License to nickel platers will be granted through the Harshaw Chemical Company of Cleveland, the McGean Chemical Company of Cleveland, the Pyrene Manufacturing Company of Newark, the Seymour Manufacturing Company of Seymour, Connecticut and the Udylite Company of Detroit.

In commenting on the formation of the new company, Mr. Aukerman, the president said, "Our process was the first bright nickel process to be used in the United States and today the advantages of bright nickel are well-known and accepted by a majority of our larger industries who turn out plated products. The Schloetter patent No. 1,972,693 issued to Max Schloetter in 1934, has been widely used, the process having been licensed through the Metal Finishing Division of the Pyrene Manufacturing Company.

"However, with the organization of the Bright Nickel Corporation licensees will have the advantage of all improvements developed by the Pyrene Manufacturing Company and the Parker-Wolverine Company during the past four years, including the benefits of their experience and service, as well as patent protection under the Schloetter patent.

"Through our sales arrangement with the leading chemical companies now engaged in supplying nickel plate processes and materials we feel sure that all of the technical problems of nickel platers who desire to use the Bright Nickel process will have the finest engineering and laboratory experience."

DETROIT BRANCH

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ANNUAL EDUCATIONAL SESSION AND BANQUET

HOTEL STATLER

Saturday, December 10, 1938

Electrolytic Etching of Steel. By M. BAEYERTZ. *Trans. Am. Soc. Metals*, **25,** 1185-97 (1937). Steel is made the anode in 10% chromic acid (CrO_3) solution. Applicable to ordinary, alloy, and stainless types of steel. *Chemical Abstracts*, June 10, 1938, pp. 4081 ff.

Nickel Plating. By A. C. WEST, *Can. Metals, Met. Inds.*, **1,** 84-7, (1938). Theory of nickel plating, preparation of basis metal, plating baths, and bright nickels are discussed.

The Aging of Plating Baths. By A. POLLACH. *Oberflächentech.* **15,** 41-3, (1938). The chromium bath is almost always artificially aged. In chromium baths there is an accumulation of iron which, however, especially in the beginning, exerts a fairly favorable effect on the throwing power of the bath. A third aging phenomenon which has not yet been explained is that the chromium bath becomes less and less sensitive with time against impurities; even with as much as 30 g./l. Fe_2O_3 in the bath satisfactory deposits are obtained.

Nickel baths show similar aging phenomena, particularly those containing addition agents. Baths with citric acid give, in the course of time, lighter and finer-grained deposits. Old nickel baths become less sensitive against additions of acid and alkali and change their pH very little. Artificial aging of nickel baths containing cadmium removes the excess of cadmium, which, just as zinc, produces black-striped deposits. Artificial aging of silver baths is not used very much. It has been found that the natural formation of carbonates from the cyanides in the bath improves deposits, as they become lighter and smoother; carbonate contents up to 30 g./l. (4 oz./gal.) can be considered as normal. The same is true of cyanide copper baths and brass baths, and also cadmium baths which in time carbonate. Acid copper baths age naturally by absorbing small amounts of organic materials which make the deposits finer grained and harder, and finally brittle. M. HARTENHEIM. *Chemical Abstracts*, May 20, 1938, **32**, 3699 ff.

Adherent Copper Deposits on Stainless Steels. By H. T. SHIRLEY, *J. Electrodepositors' Tech. Soc.* **14,** preprint, 2 pp. (1938). Stainless steel is made cathode in sulfuric acid, 300 g./l. (40 oz./gal.) at a current density of 3 amp./sq.dm. (28 amps./sq.ft.) for 3 minutes. Then without rinsing it is transferred to an acid copper plating bath, containing $CuSO_4.H_2O$, 220 g./l. (30 oz./gal.), and H_2SO_4, 50 g./l. (6.7 oz./gal.), and plated for 15-20 seconds. Adherent copper will plate on part of the surface. The steel is then transferred back to the first bath and the cycle of treatments repeated as before until copper has deposited over the entire surface. ABNER BRENNER.

Tests and Conditions for Nickel Plating for Decorative Purposes. By M. BALLAY. *Metaux & Corrosion*, **13,** 4-19 (1938). Examination of nickel coatings less than .03 mm. (.0004 in.) thick, by microscopic, magnetic, and electromagnetic methods. For stripping nickel-plated brass, use a solution of 150 g. $FeCl_3$, 100 g. $CuSO_4$, 250 g. glacial acetic acid. For stripping furni-

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ture parts, a solution of: 80 c.c. HNO_3, 20 cc. H_2SO_4, and 40cc. H_2O; with this mixture the speed of solution of nickel at 18.5° C. (65° F.) was .00165 mm./min. (.000065 inches/minute); and at 22.5° C. (73° F.) was .00195 mm./min. (.0000768 inches/minute). Rolled nickel dissolves much faster than electrolytic nickel. Porosity of the coating decreases with the increase in thickness. Pits in the nickel plate are due to absorbed hydrogen. Roughness is due to inclusions. A brittle nickel deposit produces cracks which hasten corrosion. Porosity is tested by the salt spray. In testing the porosity of nickel on steel, $K_4Fe(CN)_6$ paper (filter paper moist with 10 g./l. NaCl and 1 g./l. $K_4Fe(CN)_6$) is used. The porosity of nickel on copper is tested by a solution of 100 g. trichloracetic acid, 400 cc. ammonia, 700 cc. H_2O. For adherence there is not a practical test. Salt spray is the most effective corrosion test of nickel coatings.

The value of an Alternating Bend Test in the Examination of Nickel Deposits. By A. W. HOTHERSALL and G. E. GARDAM. *J. Electrodepositors' Tech. Soc.*, **14,** preprint, 12 pp. (1938). The Jenkins alternating bend test can be applied to nickel deposits to determine whether the bath is contaminated. The test consists in bending a specimen of nickel, about 1 x $\frac{1}{2}$", and about .005" thick, around a jaw 0.04" in radius. The bend number is the number of 180° bends necessary to fracture the specimen. The bend number N is related to the thickness of deposit T by equations of the form $(N - k_1) \times T = k_2$, where k_1 and k_2 are constants for a given set of plating conditions. Deposits from baths containing NH_4Cl, or 200 g./l. (27 oz./gal.) Na_2SO_4 have a smaller N than deposits from a bath containing only $NiSO_4$, KCl, and H_3BO_3. Current density, temperature, and pH do not have much effect on N. The test reveals the effect of bath contamination even though the deposit presents an unchanged appearance. Dextrin, or gelatin in the bath, in amounts as small as several mg./l., can be detected by the test. 0.024 g./l. (.0032 oz./gal.) dextrin reduces N from 25 to 1. The best method of removing organic contamination is to add 1 g./l. (0.134 oz./gal.) $KMnO_4$ and allow bath to stand 2 days at a pH of 3 before use.

ABNER BRENNER.

The Stripping of Chromium Electrodeposits for Thickness Measurements. By S. G. CLARKE, *J. Electrodepositors' Tech. Soc.* **14,** preprint, 7 pp. (1938). Thickness of chromium plate is measured by timing the period of gassing when the chromium deposit is treated with HCl (sp.gr. 1.16) containing 20 g./l. Sb_2O_3. The specimen may be immersed in the reagent or the reagent may be placed in a ring glued to the surface of the specimen. Each .00001" of chromium requires about 10 seconds for solution at 20° C. (68° F.) The rate is markedly affected by temperature. Results are correct within about 25%. Chromium may be stripped from nickel, copper, or iron by dilute sulfuric acid (50 ml. con. H_2SO_4 per liter) heated to 70° C. (158° F.). Also in *Metal Ind.* (London **52,** 391-3) (1938). ABNER BRENNER.

The Coloring of Cadmium. By WM. J. ERSKINE, *Monthly Rev. Am. Electroplaters' Soc.* **25,** 91-4 (1938) (Abstract not copied) ABNER BRENNER.

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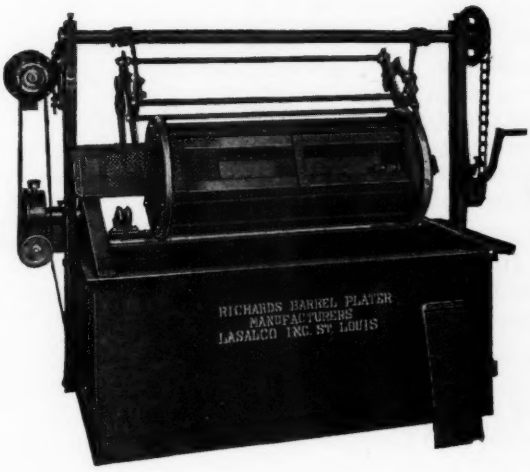

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Also several other Abstracts of articles in THE MONTHLY REVIEW. Not copied, as we have these in our files.

Electrodeposition of a Lead-Tin Alloy for Use in the Machine Industry. By P. P. BELYAEV and YA. N. BIRMAN. *Vestnik Metalloprom.* (*U.S.S.R.*) **17,** No. 9, 88-95 (1937). The electroplating of steel with a lead-tin alloy as a base for babbit is more economical than the hot dip tinning method. Steel must be heated to 180-200° C. (356-392° F.) and then pickled in HCl + $ZnCl_2$ before plating. S. L. MADORSKY.

The Electrodeposition of Copper-Nickel-Zinc Alloys from Cyanide Solutions. III. By CHARLES L. FAUST and GEORGE H. MONTILLON, *Trans. Electrochem. Soc.* **73,** 15 pp. (preprint) (1938). This, together with other abstracts from *Trans. Electrochem. Soc.* not copied, as we have them in our files.

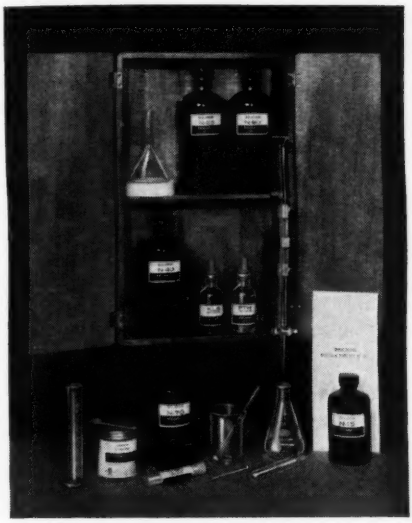
Barrel Finishing of Metal Products—No. 17—Barrel Finishing Iron Parts. By H. LEROY BEAVER. "*Product Finishing*", 27-35, Sept. 1938. Iron, after all, is most widely used metal, thus its finishing is highly important. Parts, if castings, have usually been treated to remove fins, gates, sprues, etc. by wheel grinding previous to the barrel tumbling. Barrel used has cast iron or steel shell. High and narrow type barrel best. Abrasives used are either of natural or artificial type. Slag, pumice, Fluor Spar, quartz, silica, diatomaceous earth, Kiesselguhr, Tripoli, granite, Calcite and Corundum are described and properties discussed. Silica sand is one of cheapest and most widely used abrasives. Granite and Calcite or oyster shell is a commonly used combination. Load barrel 2/3 full of work, add equal parts of granite and crushed oyster shell and water. Materials progressively disintegrate. This gives increasing fineness of finish. Gives soft, white, fine matte finish, free from graphitic carbon smut. PHIL J. RITZENTHALER.

Design for Plating. By LOUIS WEISBERG. "*Product Finishing*", 18-25, Sept. 1938. Article presents important points in regard to the much neglected field of design for plating. Importance of correct design on quality and cost of finishing cannot be over emphasized. Good design seeks to get best balance of utility, appearance and style. It also takes account of how it is made and finished. Many features in design which give trouble in plating can be modified by designer. Designer should co-operate with plater or have enough working knowledge of plating to see difficulties. First, plating requires good surface; nicks or scratches may have to be removed, as well as soldering or welding residues. Surface preparation may be either mechanical or chemical. Chemical preparation includes acid pickling or bright dipping brass and copper. Mechanical preparation includes grinding, polishing, ball-burnishing, etc.

Shape of piece is all important. If such that it cannot be properly polished, this will show in final finish. Narrow grooves or sharp corners are examples of above. Designer must have all parts accessible to buffing wheel. Changes must be made before production starts, as they are costly afterwards.

Consideration must also be given to drainage of pieces having recesses, or pockets which retain solution. Hollow articles can be drained sometimes by drilling two holes for release of solution. Recesses and corners may also

NEW! NEW!



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give cleaning trouble due to polishing compound packing in them. Metal turned over into a bead gives trouble by trapping grease or solution. Shape of piece is important in racking as is location of holes, etc. Shape also controls distribution of plating. Chromium will give most trouble in throwing power. Zinc base die castings require special plating procedure. Article again pleads for co-operation with plater. PHIL J. RITZENTHALER.

METALS AND ALLOYS ABSTRACTS

Bright Pickling of Steel. By W. HEIMBERGER. "*Oberflachentech*", Vol. **15**, pp. 43-44, Mar. 1938. Bright pickling of steel is produced, according to a new pickling process by action of colloidal ferri-compounds in solution of sulfuric acid. These colloidal compounds form spontaneously if pH of pickle is kept at 1.8-2.8 at 70° C. Material pickled in this manner keeps longer in storage. PHIL J. RITZENTHALER.

New Electrodeposition Process for Making Non-Ferrous Screens. "*Steel*", Vol. **102,** May 2, 1938, p. 47. Nickaloy Corp. forms finished metal products by electrodeposition of Cu, Ni, Zu, etc. Scrap metal used as raw material to lower cost, the work being done in acid bath. Design is printed on smooth alloy metal cathode by rubber matrix, spots to be the holes in screen cathode placed in Cu bath and built to .008, and of any desired hardness. Radiator cores are also made by plating on alloy of low melting point. This alloy core is melted out after plating. Finished gaskets are also made. PHIL J. RITZENTHALER.

Anodic Behavior in Cyanide Copper Baths. By HAROLD J. READ and A. KENNETH GRAHAM. *Trans. Electrochemical Society* **74** (preprint 1) (1938), 13 pp. In a bath containing copper cyanide 3.5, free cyanide 0.75, Rochelle salts 4, and sodium carbonate 2 oz./gal., temperature 131° F., a polarization corresponding to the formation of a white cuprous compound occurred at the anode when its c.d. was 10 amps./sq.ft. At 13 amps./sq.ft., a second polarization corresponded to a blue cupric film. Between 10.7 and 12.8, the pH did not affect these reactions; but at a pH of 13.3 the polarizations occurred at lower c.ds., above which the copper acted as an insoluble anode. With a free cyanide of 2 oz./gal., higher c.d.s were required for the polarizations. This was also true when the copper cyanide was increased to 5.5. and 7.0 oz./gal., probably because of liberation of free cyanide. High tartrate (8 oz./gal. Rochelle salts) effects the cuprous polarization at lower c.d. and eliminates the cupric polarization. 9 oz./gal. carbonate lowered the c.d. needed to produce polarization at the lower pH values (10.3, 11.6), and the copper acted as an insoluble anode at higher c.d. (without excessive polarization). When both copper and iron anodes were used, no current flowed through the iron until the first polarization occurred at the copper; the behavior of the copper anode was not affected by the iron anode if the actual current carried by the copper was considered.

ERNEST H. LYONS, Jr.

Silver Plating From Complex Iodide Baths. By D. K. ALPERN and S. TOPOREK. *Trans. Electrochemical Society* **74,** (preprint 14) (1938), 4 pp. Bright, adherent electrodeposits of silver, equal in quality to those

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obtained from the customary cyanide silver bath, were given by a bath containing 0.24 *N* silver (3.2 troy oz./gal.), 3.47 *N* potassium iodide (77 av. oz./gal.), and 0.05 *N* sulfuric acid (0.33 oz./gal.), temperature 74° F., pH 3.0 to 0.65. The lower pH values gave the best cathode efficiencies (up to 95%) and the best quality of plate. With stirring, c.ds. up to 17 amp./sq.ft. were used. The sulfuric acid can be replaced by hydrochloric, citric, maleic, or acetic acids without affecting the results, as its only function is to lower the pH. Although the throwing power and maintenance requirements of the bath are not reported, the authors state that costs and efficiencies are comparable to those of the cyanide baths. ERNEST H. LYONS, Jr.

The Electrodeposition of Silver from Solutions of Silver Nitrate in the Presence of Addition Agents. By ROBERT TAFT and LEE H. HORSLEY. *Trans. Electrochemical Society* **74,** (preprint 6) (1938), 13 pp., illus. The effect of 169 addition agents in electrodepositing silver from 0.25 *M* silver nitrate solutions at 30° C. and a cathode c.d. of 0.5 amp./dm.$_2$ was studied. Where solubility permitted, the concentration of the addition agent was 0.01 *M*, or 0.1% where the molecular weight was unknown. In general compounds of high molecular weight, including colloids, produced large needles, fibers, plates, or striated deposits, and the deposit did not analyze 100% silver. Fine deposits were generally produced by organic acids or salts with several carbon atoms, particularly the higher fatty acids. Here again the cathode deposit was not entirely pure. ERNEST H. LYONS, Jr.

Ethylene Diamine as an Ionizing Solvent. By GARTH L. PUTNAM with KENNETH A. KOBE. *Trans. Electrochemical Society* **74,** (preprint 5) (1938), 14 pp. In the electrodeposition of active metals which cannot be deposited from water solutions, ethylene diamine can be used as a solvent instead of liquid ammonia, and does not demand such involved experimental technique. From such solutions, sodium, potassium, lithium, and magnesium were deposited with good efficiencies. Density, conductance data, etc., are given. ERNEST H. LYONS, Jr.

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EDUCATIONAL SESSION at 2 P. M. with the following speakers:

W. J. R. Kennedy, Executive Secretary, American Electroplaters' Society, Presiding. George B. Hogaboom, Hanson-Van Winkle-Munning Co., Matawan, N. J. *Subject*, Production of Colored Finishes on Metals. The wonderful display of finishes shown at the Milwaukee Convention will be seen. Derrick S. Hartshorn, Westinghouse Co. Springfield, Mass. *Subject*, Adjusting the pH of Hot Nickel Solutions. Oscar A. Stocker, Electro Chemist, Seymour Mfg. Co. Seymour, Conn. *Subject*, General Discussion of Bright Plating.

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Chromium Plating—Its History and Development. *The Metal Industry*, London, England. Volume **LIII,** No. 2, September 9, 1938. A booklet recently published by W. Canning and Company, Ltd., Great Hampton Street, Birmingham, 18, gives details of the history and development of chromium plating. The following is a short abstract of the subject-matter contained in the booklet. The first mention of the electro-deposition of chromium is contained in a patent taken out by C. J. E. Junot in December, 1852. This was followed by the work of Bunsen in 1854, and during the years 1890 to 1894, Placet and Bounet took out several patents relating to the deposition of chromium.

The general considerations of the solution are next discussed. It may be accepted that the majority of solutions now being operated in the commercial deposition of chromium are essentially of the composition laid down by Carveth and Curry and amplified by Sargent, with one or two possible exceptions. The general practice in England is to use a much lower current density than is prevalent in America and a consequently longer time of deposition is allowed. The use of high current densities favors increased cathode efficiencies but decreases the "throwing" power of the solution.

Throwing power is governed by the conductivity of the solution and the temperature employed. In general, the more highly conductive the solution the less the throwing power. ROBERT B. GOODSELL.

Industrial Electroplating Processes. By S. C. TAORMINA. *The Metal Industry*, London, England. Volume **LIII**, No. 2, September 9, 1938. The author describes methods for the effective control of electroplating processes. He discusses the various control factors involved, including the proper use of instruments for electrical control, the number of tanks, solutions and the proper standards, chemical analysis, equipment required and the interpretation of results.

He also gives some valuable electroplating solution standards for nickel bath and the various cyanide baths. The author also stresses the importance in standardizing all solutions and keeping records of each solution which will eventually cut the time and number of analysis down to a minimum.

Table 1. Lists the higher limits of current required for various processes. This list contains 30 different types of solutions and gives Current Density in Amps./Sq. Ft. for each one.

Table 2. Lists the nickel solution formulas in general use today.

Table 3. Shows typical Brass and Bronze solutions standards for still brass and barrel brass solutions.

In regard to silver solutions, the important factor in controlling them is maintaining the solution as close as possible to the original formula and supplying the bath with plenty of anodes.

In conclusion, the point is made clear that as long as the instruments of control are available, use them, and the desired results will be easily and more economically obtained. ROBERT B. GOODSELL.

Membership Report to October 1, 1938

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